



FOREIGN STUDENTS COMING TO AMERICA:

THE IMPACT OF POLICY,
PROCEDURES, AND
ECONOMIC
COMPETITION

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This is an end-of-project summary of reports undertaken for ISIM's study of S&E foreign students and workers in the United States. The project has three major components: fieldwork interviews with stakeholders and foreign students, subcontracting of experts to report on competitive policies in foreign countries, and an analysis of labor markets and their potential effect on the supply and demand for S&E workers.



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PROJECT SUMMARY REPORT

DECLINING NUMBERS OF S&E STUDENTS AND IMMIGRANTS: POLICIES, LABOR MARKETS, AND GLOBAL COMPETITION

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PROJECT SYNTHESIS REPORT AND POLICY RECOMMENDATIONS

FOREIGN STUDENTS COMING TO AMERICA: THE IMPACT OF POLICY, PROCEDURES, AND ECONOMIC COMPETITION

Following a period of sustained growth, the number of foreign students coming to America declined in 2002 and the numbers did not begin to rebound strongly until 2005. At first, it appeared that America's "immigration policies" were the principal deterrent for foreign students—either because 9/11 tightened security procedures deterred applicants, or because our admission policies are not as attractive as those of new competitors. While visa procedures in the immediate aftermath of 9/11 did deter potential applicants, we attribute the decline to the confluence of several factors that, more so than in a typical cyclical phenomenon, reinforced the effect of each other—a perfect storm where security procedures compounded the situation. In particular, the 2001 economic recession hit source countries hard, reducing the ability of potential applicants to afford higher education at the same time as the cost of U.S. education spiked. And our surveys of foreign students find that the high cost of U.S. education is the greatest deterrent to choosing a U.S. education; while the he cost of public education soared to 7 percent annually 2002-2005, more than twice the average rate of annual increase over the previous two decades. We recommend that visa policies and procedures should be more transparent, efficient and adhere to recognized standards, as well as, that changes in the nature of the student visa be made. (48 ss page, project synthesis report)

U.S. COMPETITIVENESS: FOREIGN STUDENTS IN SCIENCE, TECHNOLOGY, ENGINEERING AND MATH — PRESENTATION AT REFLECTIVE ENGAGEMENT WORKSHOP

This meeting presents, and opens for discussion, the findings of a research project into the post 9/11 decline in foreign student applications to American universities. Until the recent, modest recovery of student applications most observers argued that hostile, regulatory bottlenecks caused the decline. Now concern is turning to academic and job competition for international graduate students. (Meeting held at Georgetown Law School, November 14, 2006)



POLICY BACKGROUND: REVIEW OF EVENTS AND INTERVIEWS WITH STAKEHOLDERS

HOW OPEN THE DOOR? THE POLICY DEBATE ON INTERNATIONAL STUDENTS AFTER 9/11

Tracing the outline of this evolving debate over foreign students in the United States is the purpose of this short paper. It will begin with a short review of the security measures that affected foreign students in the wake of 9/11 and the concern these changes engendered from the academic, research, science and business community. Next, it will consider the efforts of various government agencies, chiefly the Department of State, to remedy some of the difficulties identified as barriers to international study in the United States. Finally, it will consider the current direction of the debate over international students, with a focus on the concerns and recommendations of various stakeholders. (30 ss page draft report)

SEVIS: TRACKING INTERNATIONAL STUDENTS

With the rollout of the Student Exchange Visitor Information System (SEVIS.) in 2003, the federal government fundamentally changed the process for tracking foreign students in the United States. Prior to the implementation of the web-based, real-time system for gathering information, the government's ability to monitor individuals in the United States was severely limited. This report examines the short history of the new tracking system and documents its successes, its continuing challenges, and the implications of both on international education and the flow of international students to the United States. The findings are based on a review of the relevant legal and statutory architecture, available literature (including government and media reports and recent scholarship), and personal interviews with government and university officials with extensive knowledge of the system. (23 ss page draft report)



THE U.S. LABOR MARKET: STUDENT PATHWAYS AND OUTCOMES

THE WAGES OF SKILLED TEMPORARY MIGRANTS: EFFECTS OF JOB PORTABILITY AND STUDENT STATUS

More highly skilled “temporary” migrants are admitted yearly to the USA than skilled permanent immigrants. This phenomenon is relatively new and there is little empirical research with credible data that establishes the relative earnings or impact of skilled temporary workers. We use the NSF’s National Survey of College Graduates which asks visa questions and follows up the college-educated population enumerated in the 2000 Census. We frame the competing expectations on temporary worker earnings: prevailing wage equality, lower reservation wages, segmented markets, visa-job portability, and visa pathways. The findings indicate that visa-job portability and visa pathways (student to worker) significantly reduce the earnings of temporary foreign workers relative to U.S. college-educated natives. Further, tests of the impacts of temporary workers appear to indicate that they adversely impact wages and unemployment. While large scale temporary programs may have certain benefits, they have not been well managed to date. (22 ss page draft report, accepted for presentation at the Population Association of America, March 2007).

IMPACT OF H1B VISAS ON HIGH-SKILLED OCCUPATIONS

This report assesses an econometric estimate of the impact of H-1B temporary visa holders on the wages of domestic workers during the years 1999 to 2003. An estimate of the percentage of H-1Bs in some two dozen occupations is first made. Then the wages of U.S. natives and immigrants is regressed on a two-stage least squares estimate (2SLS) of the occupational share using a pooled cross-sectional, time-series model with fixed effects (also tested for robustness using a Hierarchical Linear Model). The findings indicate that the elasticity for H-1B effects is statistically significant and inverse, e.g., an increasing percentage of H-1B employment decreases the earnings of both U.S. natives and other, recently-arrived immigrants. (12 ss page draft paper)



THE STUDENT MARKETPLACE: STUDENT PERCEPTIONS AND GLOBAL COMPETITION

STUDENT PERCEPTIONS ABOUT A U.S. EDUCATION: A SURVEY OF STUDENTS ABROAD AND IN AMERICA

In order to better understand the causes of recent numerical trends in the admission of foreign S&E students to the United States we studied two cohorts of foreign students: undergraduate and graduate students currently studying in the United States; and prospective foreign students who considered, but ultimately chose not to study in the United States. We sought to better understand what aspects of the entire application process these students felt to be most cumbersome and how this affected their experience. Foreign students who considered studying in the US but declined to carry out their studies here were contacted to gauge what most deterred their interest. Focus groups with foreign students currently in the United States were held at three major universities. Foreign students who chose not to study in the United States were contacted via email to complete a web survey. (22 ss page completed report)

GLOBAL COMPETITION FOR INTERNATIONAL STUDENTS

The year 2002 marked the first time the number of international students admitted to study at US institutions of higher education decreased after a period of constant growth during the 1990s. Many factors drove the decline, including the intensification of the global competition for international science and engineering students, especially in other developed English speaking countries such as the U.K., Canada, and Australia as well as in non-English speaking countries such as France and Germany have affected the US's dominant position. Traditional source countries such as China and India have also increased their capacities in higher education. As part of its research agenda, ISIM contracted five expert papers and convened a Workshop on Global Competition for International Students in North America, Europe, and Asia. This paper reviews those expert papers and incorporates the workshop discussion. (48 ss page completed report)



GLOBAL COMPETITION FOR INTERNATIONAL STUDENTS — MEETING ORGANIZED FOR DISCUSSION OF EXPERT PAPERS

This meeting brought together 30 individuals from various academic and government agencies for a discussion of the presentation of five expert papers. (Georgetown University in March 2006).

THE EDUCATION, IMMIGRATION AND EMIGRATION OF CANADA'S HIGHLY SKILLED WORKERS IN THE 21ST CENTURY

DON J. DEVORETZ, SIMON FRASER UNIVERSITY

This paper traces Canada's history of augmenting its human capital formation through the recruitment of immigrants and foreign students during the post-1967 period to 2005. In this framework Canada's brain exchange with the United States and the rest of the world is estimated in terms of numbers of movers and the values of the embedded human capital. Two separate econometric models are estimated for Canada's demand functions for skilled immigrants and foreign students respectively. An analysis of these demand functions and limited student narratives allow an assessment of Canada's competitive position on the recruitment of highly skilled workers circa 2006. (55 ss page, completed report)

FOREIGN S&E STUDENTS IN FRANCE AND GERMANY

CHRISTIANE KUPTSCH, ILO; AND PHILIP MARTIN, UC DAVIS

The number of foreign students in the OECD countries doubled between 1980 and 2000 to almost 1.8 million and one forecast projects the number to quadruple to 7 million by 2025. This paper examines enrollment patterns and the employment of foreign students in Western Europe. European countries have changed from an emphasis on education for understanding and aid, to education for trade and a quest for brains or human capital, as universities seek revenues from (full) fee-paying foreign students and employers seek foreign graduates of local universities. This paper explores foreign students in France and Germany t emphasizes three major points. First, these countries are relative latecomers to the mercantilist theory that the key to economic competitiveness is human capital. Second, the EU and most EU member nations are following in the footsteps of the US. Third, there is not yet a significant backlash against foreign students competing for scarce university slots or accused of holding down wages in science and engineering fields. (27 ss page, completed report)

INTERNATIONAL COMPETITION FOR S&E STUDENTS AND WORKERS: AN EVALUATION OF TRENDS AND POLICIES IN INDIA AND SOUTHEAST ASIA

BINOD KHADRIA, ASIA RESEARCH INSTITUTE, NATIONAL UNIVERSITY OF SINGAPORE, AND JAWAHARLAL NEHRU UNIVERSITY, NEW DELHI

In the course of the 20th Century, the United States has attracted S&E human capital embodied in tertiary-level students and high-skill workers from all over the world that has sustained its widespread educational, scientific and industrial infrastructure, giving it a lead over other countries for decades. In India, investment in education has been a determining factor in sustaining the migration of S&E students and workers to the US, operationalizing the demographic advantage of a younger population, and the opportunity of worker turnover through H-1B and BPO. This paper examines the trends and policies in India and Southeast Asia, the major focus being on the former, with a view to analyzing the implication of the international competition between the United States and its contenders operating in these two regions. (50 ss page, completed report)

CHINESE STUDENT AND LABOR MIGRATION TO THE UNITED STATES: TRENDS AND POLICIES SINCE THE 1980S

DUDLEY L. POSTON, JR., TEXAS A&M UNIVERSITY; AND HUA LUO, CHINA INSURANCE REGULATORY COMMISSION (XINJIANG BUREAU)

Historically, Chinese immigrants to the United States are a special group. They were banned for almost a century, but in the past few decades their numbers have increased rapidly. China usually ranks among the top two or three countries sending student immigrants to the U.S. Since 1983, Chinese students have comprised over 10 percent of all foreign students in the United States. But the numbers of labor immigrants from China are a very small portion of the total number of laborers who immigrate each year to the U.S. In this paper we have endeavored to advance the understanding of patterns of Chinese immigration to the U.S. from the beginning of the 1980s to 2002. We focused in particular on permanent immigration, student immigration, and skilled and unskilled labor migration. Special focus was given to the effects of U.S. immigration laws on Chinese immigration. (51 ss pages, completed report)





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EXECUTIVE SUMMARY

Following a period of sustained growth, the number of foreign students coming to America declined in 2002 and the numbers did not begin to rebound strongly until 2005. At first, it appeared that America's "immigration policies" were the principal deterrent for foreign students—either because 9/11 tightened security procedures deterred applicants, or because our admission policies are not as attractive as those of new competitors. While visa procedures in the immediate aftermath of 9/11 did deter potential applicants, our analysis shows other causes were at work.

We attribute the decline to the confluence of several factors that, more so than in a typical cyclical phenomenon, reinforced the effect of each other—a perfect storm where security procedures compounded the situation:


- The rapid implementation of pre-existing visa procedures after 9/11 created a regulatory environment that chilled, but did not "restrict" student applications.
- The 2001 economic recession hit source countries hard, reducing the ability of potential applicants to afford higher education at the same time as the cost of U.S. education spiked.
- Our surveys of foreign students find that the high cost of U.S. education is the greatest deterrent to choosing a U.S. education.
- The cost of public education soared to 7 percent annually 2002-2005, more than twice the average rate of annual increase over the previous two decades.
- Many foreign students have come to rely on U.S. employment to defray their college costs and the U.S. recession and jobless recovery affected those prospects.

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- Trends in the student visa issuances by source regions show a variety of patterns, many of which suggest economic and/or political shocks that preceded 2001.
 - The increasing international competition led some students to opt to study in countries other than America, but the short-term impact was not large.
 - There will be increasing international competition over the longer term, but insisting on America's "market share" misleadingly defines foreign students as a dwindling natural resource.

We conclude that the United States will remain a desirable destination for foreign students in the years ahead. Visa numbers are already showing a rebound from the low levels of 2002. Yet, we have also identified a number of reforms needed in US policies to ensure the continued competitiveness of the U.S. educational system.

We recommend that:

- Visa policies and procedures should be more transparent, efficient and adhere to recognized standards.
- Admissions policies should be more flexible to respond to changes in the economy and labor markets.
- The Departments of State and Homeland Security should engage in regular evaluations of their current procedures, as well as managerial assessments of future scenarios and responses.
- Cooperation between government agencies and academia should be expanded.
- SEVIS needs refinement, especially on technical aspects of changes in students' academic or visa status.
- Student advisors need to recapture their role as student advocates.

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- The many overlaps between non-government organizations, academic, and government are welcome and should be enhanced.
 - Student optional practical training should permit two years of work authorization.
 - The impact of the 2001 recession may have been particularly hard precisely because the policies of the 1990s, combined with the dot.com bubble, significantly altered the portfolio of options open to foreign students.
 - Student spouses should be permitted to work off campus in jobs certified not to displace native workers.
 - The path to permanent residence should be eased for foreign student graduates who remain in the United States, rather than expanding access to the H-B visa program.
 - National debate is needed on the role of the federal government in fostering the competitiveness of the United States in attracting and retaining foreign students. Some questions to address: Should the federal government provide subsidies to offset high tuition and living costs, and, if so, at what level of education (graduate and/or undergraduate level)? Also, should the Federal government play a greater role in marketing to international students?

INTRODUCTION

Following a period of sustained growth, the number of foreign students coming to America declined in 2002 and the numbers did not begin to rebound strongly until 2005.¹ That trough in the supply of enrollees raised alarms on America's campuses and beyond to stakeholders who advocate for foreign students to supply business, science, and engineering jobs after graduation. We examine the prevalent claims that "restrictive" admission policies were the major reason for the decline, even if it is usually acknowledged that other factors played a role. Our analysis indicates that bottlenecks in admission procedures compounded the underlying factors that drove the downturn, not a change in America's policy framework. The primary factors that initiated and drove the decline were prosaically economic, even if students as well as tourists also harbored concerns about travel in the aftermath and uncertainty of the terrorist acts of 9/11.

Our primary interest is in the supply of foreign students in the fields of Science, Technology, Engineering and Mathematics (STEM). Foreign students made up about one-third (35 percent) of core-STEM enrollees in the 2000/01 academic year with social science enrollees adding another twelfth (for a total of 42 percent). Those proportions remain roughly the same, even though there have been enrollment losses in the computer sciences and engineering, because enrollments in physical and life science increased.² Foreign students make up roughly 4 percent of STEM bachelor graduates, 28 percent of STEM master graduates, and 32 percent of STEM doctorate graduates.³ In short, foreign students are a significant share of the U.S. STEM student body.

While concern about the decline in foreign student numbers went beyond STEM fields, the possibility of declines in STEM is thought to be of particular concern. It is echoed in concerns that the U.S. is losing its dominance in research and development, or in its trade balance, or its stock markets; or its energy independence. The start of this century is not only about the economic recession which this report highlights, it is also about a pronounced expansion of globalization. China and India, in particular, are projected to surpass the United States economically in just a few decades. The European Union has pledged itself to rebuild its educational institutions and to boost its research capacity. Many observers argue that there are putative domestic shortages of U.S. students while, at the same time, they believe that the STEM labor force will continue to grow at a breakneck speed. Thus, foreign students are thought to be critical to retaining U.S. dominance in the evolving global economy.

Advocates and prestigious panels hurried to understand why the decline had occurred, most reaching the conclusion, in the immediate aftermath of 9/11, that U.S. policy



was restricting the flow of students, as well as business visitors and tourists. Prognostication is fraught with unknowns and, while we cannot know the future, the incipient rebound in student numbers may show the more strident of recent policy polemics to be a tempest in a teapot. But if the numbers do not bounce back, or even if they continue the relatively slower growth of the early 1990s, many observers will continue to sound alarms about policy failures. Some stakeholders will continue to hold onto the conclusion of policy failure, even if numbers rebound, because it supports an underlying advocacy for growing the number of foreign students. Indeed, the Senate's policy prescriptions in 2005 would have allocated at least a five-fold increase in visas for skilled workers and particularly foreign STEM graduates. Yet, projections suggest that current levels of immigration will readily supply projected STEM employment.⁴

But while there is a real need to reform immigration and improve the admission of skilled students and workers, many of the prevailing prescriptions may be off target if the decline was embedded in typical economic factors and if the architecture of U.S. policies did not suddenly “restrict” immigration. This report does not address the entire context of globalization nor can it tackle the question of the evolution of the STEM labor force and U.S. research and development. These are relevant issues that affect the potential future U.S. demand for foreign students and workers, but they go beyond what one report can accomplish. Rather, this report investigates the concerns about policy, procedures and the entry of other nations into a competition for foreign students. We add the impacts of the 2001 recession and the cost of U.S. education to these commonly cited reasons for the past decline.

The first section of the report examines past trends in visa issuances, looking for historical parallels, differences in trends from different regions of the world, and the impact of visa refusal rates. Surprisingly, there has been little analysis of these details and they suggest at least one historical parallel and many complex factors at play in different regions of the world. Next, we review our interviews with stakeholders and their perspectives on what changed after 9/11; and the fact that the architecture of admission policies changed little. At the same time, the “zero tolerance” procedural changes, confounded by technology problems and a lack of interagency coordination, compounded the post 9/11 climate of fear and uncertainty. Then we ask about the nature of the policy framework in the United States and compare it to other nations, demonstrating that the architecture of U.S. policy is relatively competitive. Further, we ask whether or not educational progress in source countries will further reduce the potential for the U.S. to retain its “market share” and conclude that that is unlikely. The last two sections of the report then move to examine other factors, drawing primarily on our surveys of foreign students here and abroad. Perhaps unsurprisingly, foreign students cite the high cost of U.S. education as the primary obstacle to a U.S. education with concerns



of visa procedures in second place. The final analytic tasks demonstrate that the cost of U.S. tuition spiked precisely during the period of the decline in student applications. And we examine how U.S. policy during the 1990s unwittingly set in play an increasing reliance of students on U.S. employment after graduation and how that multiplied the shock of high unemployment following the bursting of the dot.com bubble.

DIVERSITY IN VISA TRENDS PRE- AND POST-9/11

The best leading indicator of student numbers are “flow” data such as visa applications or issuances. A reliance on “stock” or enrollment data, which responds more slowly to changes, simultaneously indicates much less of a decline and also less of the incipient rebound. Figure 1 shows that there was a 20 percent drop from 2001 to 2002 in the number of F-1 student visas issued and another 8 percent drop in 2003. At the same time, there was a spike in the refusal rate for F-1 visas from around 25 percent of applications just prior to 2002 to 34 percent in 2002 and 2003. The number of foreign graduate students applying to all fields declined 28 percent between 2003 and 2004. Subsequently, the number of foreign students enrolled in U.S. institutions leveled off in 2002 and dropped by 2.4 percent in 2003 and a further 1.3 percent in 2004.

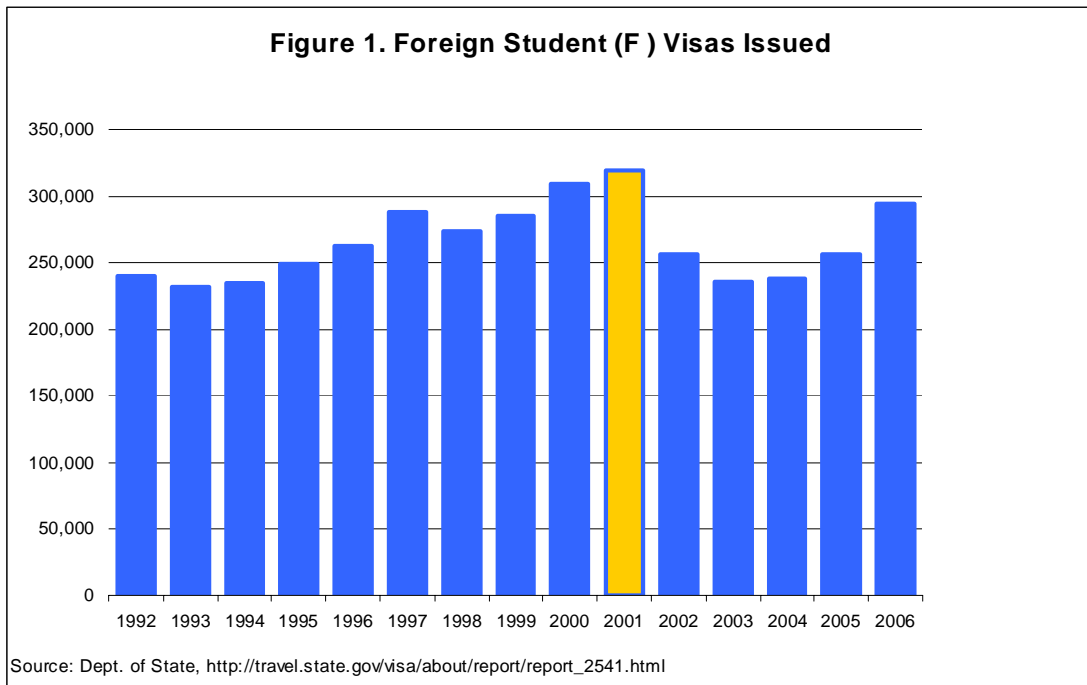


Figure 2 shows that visa issuances show strong cyclical patterns and there is a historic parallel from the early 1980s. We know of no marked changes in visa processing at that time.⁵ Rather, the visa decline of the mid-1980s appears to have resulted primarily from a sharp economic correction. Like today, it would also appear that divergent economic crisis and political events, in different nations and regions, contributed to the decline.

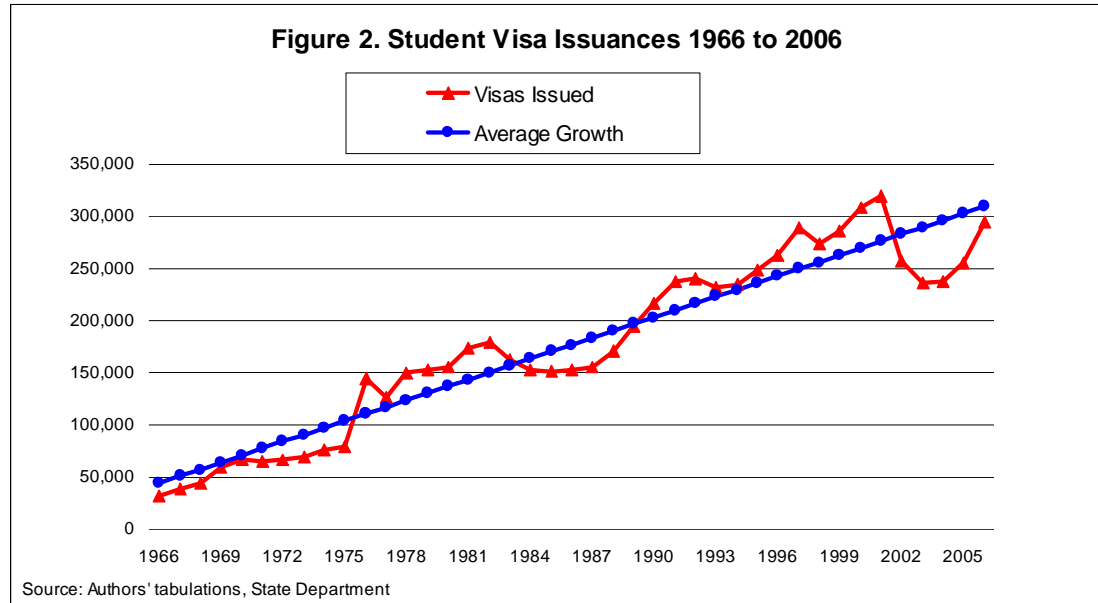
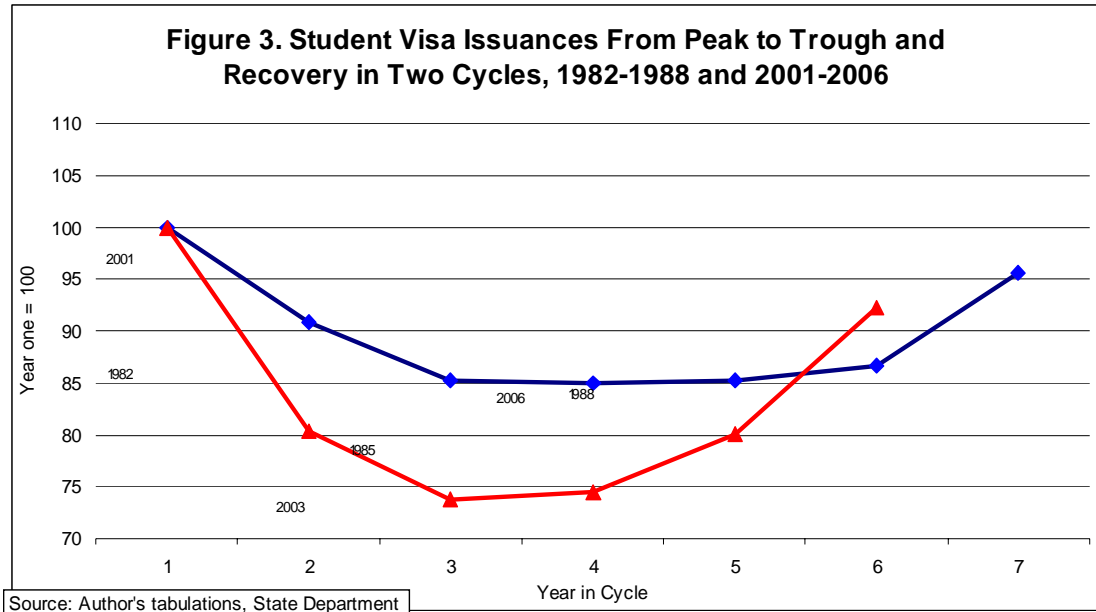


Figure 3 shows that the decline in student visas in the early 1980s shares similarities with the recent cycle in student visas. Following several years of very strong growth in student admissions, there was a trough that followed 1982 and lasted six years. There was a 15 percent drop from the high to the low point two years into the trough and the recovery did not start until the sixth year. The most recent 2001 decline in student admissions followed several years of more modest growth and was much sharper, dropping 26 percent by year two. But the recovery this time around looks like it could occur in the seventh year as the rebound began earlier and is stronger.

Economic conditions were the most obvious reason for the early 1980s drop in visa issuances. If economic growth in the source countries falters it is more difficult to afford studies in the United States. In 1981, there were 10 nations that were the source of half of all student admissions. Following several years of exceptional growth, GDP in these nations fell 9 percent in 1982 with GDP remaining relatively flat until a strong rebound in 1986. In the year 2000, just 7 nations were the source of half of all students, and they experienced a sharp drop in GDP in 2001 of 7 percent. Of course,



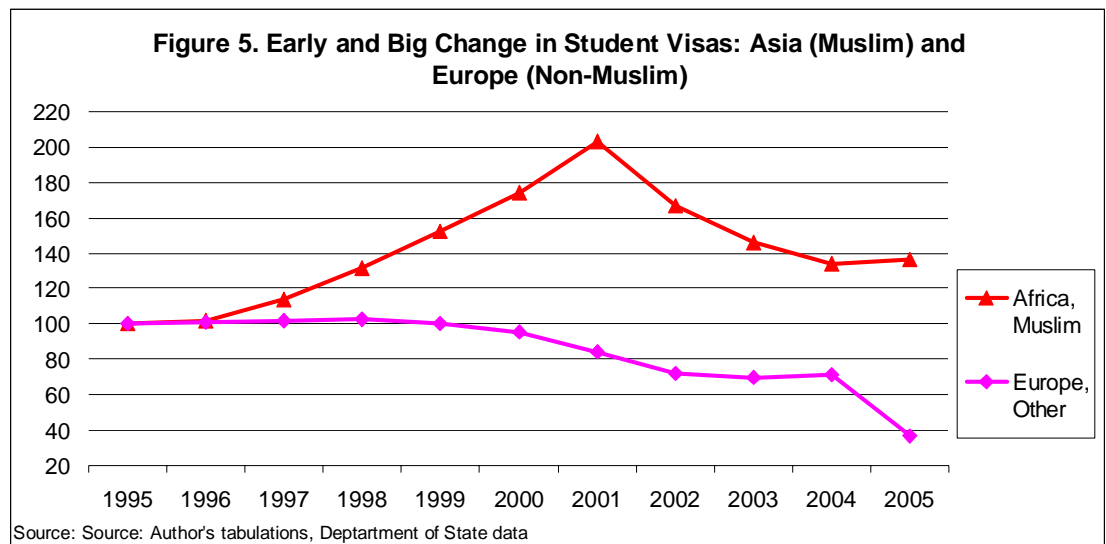
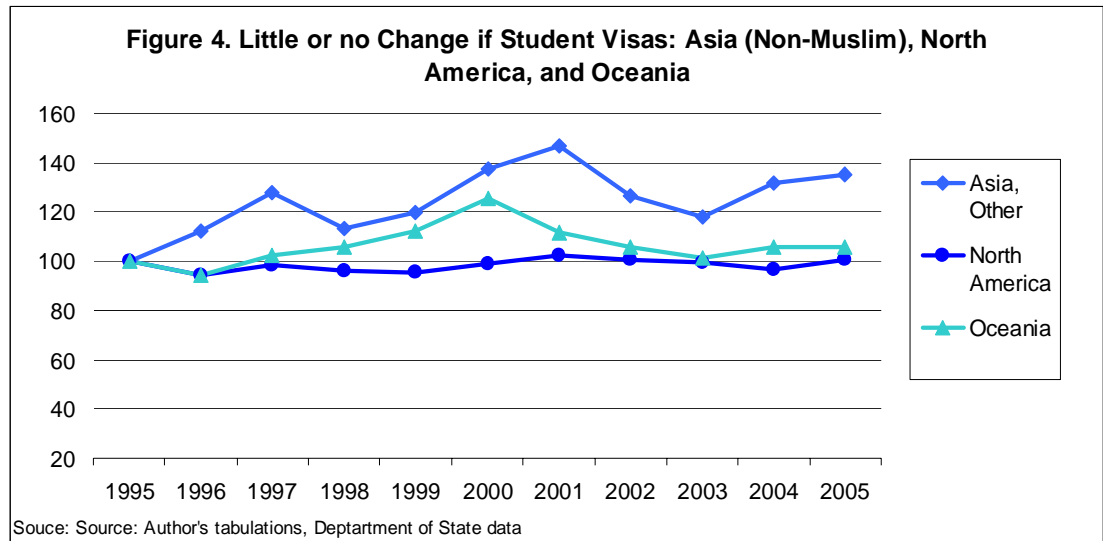
U.S. GDP growth also stalled during both troughs, a fact we return to later; and the U.S. GDP growth resumed in 2004.



Trends across groups of nations demonstrate that economic shocks and other factors also drive recent trends and these vary for each region; there is a complex interplay of factors that in both precede and follow the 2001 impacts. First, figure 4 shows nations with little or no change in visa issuances, at least insofar as trends isolated to a 2001 shock. Mexican (North America) student visas actually increased through 2003 even though Mexico was the focus of substantial concern regarding visa processing. Fewer students came from Oceania after 2001, but their numbers then remained about what they were earlier. Visas for Non-Muslim Asian nations drop following the 1997 economic crisis, taking three years to recover. The Asian visa numbers drop again in 2002, but then rebound smartly in 2004. China, India, and Japan drive much of the growth, drop and comparatively rapid rebound.

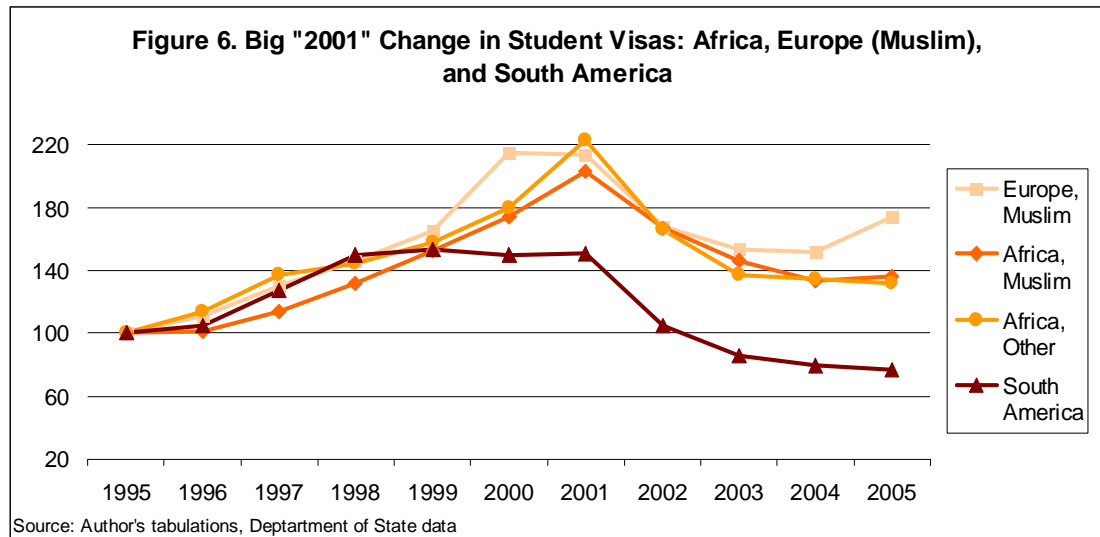
A second group of nations, shown in figure 5, demonstrate an early (pre-2001) big drop in visa issuances. Muslim Asian nations show the effect of the 1997 crisis with Indonesia and Malaysia essentially declining steadily from then until now. Other major student players, Saudi Arabia and Pakistan, saw some recovery before another steep drop in 2002. Surprisingly, visas issued to non-Muslim European students were turning down in 1999 and actually stabilized a little in 2002; only to then see a further decline in 2005. These trends appear to be driven by structural changes unique to each country and not one-off economic or U.S. procedural shocks.





Finally, figure 6 shows a third group of nations that demonstrate the much discussed imagery of strong pre-2001 growth followed by a steep post-2001 decline in student visas. African nations and Muslim European nations show this pattern. The 2001 economic shock is clearly demarcated and changes in visa processing may have particularly impacted these nations. Yet, growth in student visas from South America had already begun to slow in 1999 and decline in 2000, signaling pre-2001 economic and social problems that compounded the 2001 shock; the major players are Brazil, Colombia, Venezuela, and Argentina. Such shocks are known to impact mobility to the United States.⁶





It thus appears that concurrent events particular to each nation magnified the 2001 shocks. This was compounded by the fact that compared to the earlier 1982 trough; today's students come from fewer nations than in the 1980s. On the one hand, some of the potential impact was mitigated because Korea, Japan, and Mexico, three countries that constituted one quarter of the flow in 2001, experienced very little or no 2001 shock. In fact, many of the leading sources of foreign students experienced only a shallow decline in visa issuances.

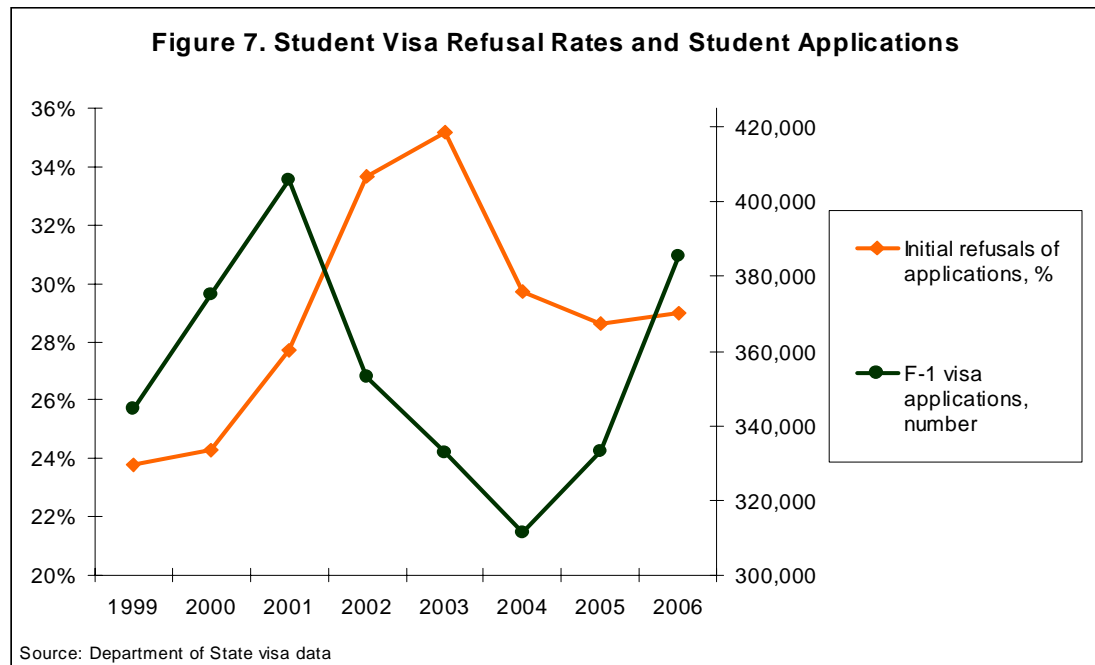
On the other hand, nine leading and particularly impacted nations with 30 percent of the flow in 2001 made up 50 percent of the decline through 2003: China, Brazil, Turkey, Saudi Arabia, Indonesia, Colombia, Venezuela, Switzerland, Kenya, Pakistan, and Argentina.⁷ Surely, in Saudi Arabia, the primary if unwitting source of most of the terrorists, changes in visa processing compounded fears of U.S. reactions to the events of 9/11. One should neither underestimate the deterrent effect of stepped up visa processing, nor the deterrent effect of concerns by potential students about their welcome. All Muslim nations made up 13 percent of students in 2001, but 24 percent of the decline through 2003. And surely changes and perceptions of difficulties in visa processing had an effect in China. However, it is hard to make a case that the Swiss would have been disproportionately affected by the new visa processing.

Further, trends in several of the South American nations listed above were strongly impacted by concurrent economic and political events. Changes in visa processing in the case of Venezuela, Colombia and Argentina surely took a back seat to currency devaluation and political shocks; both factors which are known to profoundly affect visa applicants. Political shocks alone are estimated to decrease non-immigrant visa



issuances to the U.S. by 20 percent.⁸ Brazil too has had its share of political and social issues, albeit Brazilians took great umbrage with the new visa regulations and retaliated with stricter requirements for Americans. It is likely that the perception of difficulty in getting a student visa was compounded by this climate of tit for tat.

A direct measure of changes in visa procedures would help parse out their impact. Often discussed is the fact that stepped up scrutiny post-9/11 increasingly led consular officers to refuse student applicants. Figure 7 shows that visa refusals increased from less than 25 percent to over 35 percent in 2003, and then they then dropped to less than 30 percent. The number of visa applications declined and then rebound in apparent response. But the inverse correlation is far from perfect, as visa applications were booming through 2001 even as the refusal rate increased. The 2005 and 2006 rebound in applications occurs even though refusal rates remained higher than pre-2001 levels.



In fact, the correlation between the refusal rate and visas does not appear to be strong. After all, increasing applications may also generate an increase in poor quality applicants, to say nothing of the fact that the vast majority of applicants are still approved. We estimated correlation coefficients between national nonimmigrant refusal rates and student visa issuances. It is an inverse correlation, so refusal rates deter some applicants. But the correlation is, in fact, rather small being less than a negative -0.15 for all years



measured from 1996 to 2005; and the correlation is smallest from 2000 to 2004 being less than a negative -0.10. We would prefer a regression analysis of applications that includes this variable along with others.⁹ However, it appears that increasing refusal rates were not a major deterrent.

To summarize, an examination of trends in visa issuances uncovers similarities between troughs in 1982 and 2001. Both coincide with sharp global economic corrections and both were about five years in duration. However, the decline in visas was deeper in the recent recession which suggests other conditions contributed to the decline. Recent trends in Asia and Latin America demonstrate that economic and political shocks in selected nations in those regions had their own, unique, impact on trends. The fact that more students came from fewer nations in the recent downturn also contributed to the steepness of the decline. At the same time, there is good reason to believe that visa processing compounded these effects even if that compounding effect was not a primary driver of the decline.

AMERICA'S ADMISSION POLICIES AND PROCEDURES

There are fundamental differences between policy, regulations, and implementation. To be sure, “policy” can be defined as the rationale for any plan of action, but policy more narrowly defined is the rules that guide action—it is the legislated and legal architecture that the Congress creates. That architecture is never simple, having sub-elements intended to reinforce each other although, at times, Congress fails to spell out precisely how things should happen. The administrative agencies then have varying degrees of discretion in setting regulatory apparatus to carry out Congressional directives. Yet, in the final analysis many a strong policy with a good regulatory framework fails in the implementation because there is too little funding for the agencies, or the agencies are not fully empowered to carry out their mission, or there are short- or long-lived management failures.

The most complete analysis to date of policy and its implementation in the post-9/11 environment, by the Migration Policy Institute, came to the following conclusions:¹⁰

The laxness of procedures for obtaining U.S. visas and the border inspection process and infrastructure, which lacked the tools to stop travelers with questionable or illegitimate reasons for entry, was identified as the Achilles' heels of homeland security



immediately after the September 11 attacks. The 9/11 Commission Report found that the hijackers' ability to travel freely without raising red flags was a key ingredient in their success...

As a result, the pendulum swung away from other core principles—such as... openness... toward a posture of zero tolerance for any ambiguity that might have security implications. The swing lasted for approximately two years...

The report finds that the basic legislative framework that determines who is admissible to the United States, and, by extension, the legal structure of the visa process itself, has not changed in significant ways. In fact, the visa classes themselves remain intact, applicants still must... make an application at a consular office, and a successful visa applicant gets to travel to a U.S. border where the decision to admit (or not) is made by an inspector. However, the administrative elements of the process have changed substantially. These include the expansion of interview requirements, the creation of additional security checks, the development of special registration programs, and the use of biometric identifiers.

We arrived at the same evaluation of the situation after interviewing stakeholders in the Executive Branch agencies that implement admission policy, as well as non-government actors. It is important to understand that “policy” changed little in terms of the framework that determines who we admit and why. Observers who fail to make the distinction call for legislative changes even though the legislated framework had little impact on the downturn in student visas.

Rather, the policy problems to the post-9/11 downturn were procedural in nature and, therefore, first solutions should aim at improving procedures. Stakeholders who understand these distinctions told us the same thing and, like us, most would subscribe to the recommendations of the Migration Policy Institute. It is also worthwhile recalling that post 9/11 procedural changes were, as noted, changed, in part, due to inadequacies in intelligence more than visa procedures *per se*. However, the goal of our research is to investigate policies and procedures, as well as other factors, in order to assess the broader context for the decline.

The stepped up implementation of the already-on-the-book procedures, along with new ones, took place in a very short span and with an emphasis on zero tolerance in lieu of a more tolerant process that would have resulted from the confidence of following established procedures.¹¹ The shortness of the required response time, coupled with pre-existing problems with inter-agency systems, made for an acute management challenge.

The fact that this period of zero tolerance was turned around in two short years, can be attributed to strong management at the Department of State and its strong esprit de



corp. Yet, visa applications did not rebound immediately, reinforcing the observation that trends in visa numbers are driven by the interaction of many factors.

There remain many steps that should be taken to ensure that the admission process remains smooth. There are many reasons to continue to upgrade visa procedures, from improved security to facilitating desirable student mobility, and the need to sustain the capacity to respond to future demands. We discuss below the major procedural aspects of visa adjudication.

PROCEDURES BEFORE AND AFTER 9/11

Since its passage in 1952, the Immigration and Nationality Act (INA) has controlled the admission of foreign students to the United States.¹² Amended multiple times, the Act admits foreign students on “nonimmigrant” visas, tying their entry to a specific purpose and a temporary period of time. The vast majority of foreign students at U.S. universities enter as F-1 visaholders. Smaller numbers enter as J-1 exchange visitors admitted for specific studies. Some F-1 students later work as H-1B specialty workers in post-doctoral or other academic jobs.

To obtain their visas, applicants must demonstrate to consular officers abroad and immigration inspectors at U.S. ports of entry that they have been accepted by an approved school or exchange program. They must also not be ineligible on the INA’s grounds of inadmissibility which include concerns about security, terrorism, health and crime. As nonimmigrants, the applicants must also overcome a presumed “intent to immigrate” by providing proof of strong ties to their home country as evidence of their intentions to return.

Indeed, there exists a long history of concern about balancing national security with international student access to U.S. studies. Efforts to control the transfer of sensitive technologies to foreign nationals studying at U.S. universities date back the 1954 International Traffic in Arms Regulations (ITAR). In the wake of the terrorist attack on the World Trade Center in 1993, concerns were raised when it was discovered that one of the conspirators had entered on a student visa and failed to enroll in school.¹³ In response, the U.S. Congress passed legislation to strengthen the integrity of the visa processing system and the ability to track nonimmigrants in the United States.

The Foreign Relations Security Act of 1994 made consular officials liable for granting a visa to terrorists, while the Illegal Immigration Reform and Immigrant Responsibility Act of 1996 required the Department of Justice to develop an electronic system for



gathering information on foreign students and required the then Immigration and Naturalization Service (INS) to develop an electronic entry-exit system control system. It also created criminal penalties for consular misconduct.¹⁴ The entry-exit system was to be in place by 1998, but Congress pushed back the deadline under pressure from tourism and trade groups.¹⁵ The Department of State implemented the so-called Visa Mantis program in 1998 to screen visa applicants to prevent against the transfer of sensitive technology and information. The foreign student tracking system was not implemented, however, largely because of opposition from universities about added costs and the burden on them and their students. The entry-exit system was delayed because of concerns about the cost and feasibility of implementation on the land borders.

The terrorist attacks of 9/11 brought increased attention to the security implications of the country's nonimmigrant policies. Amid much media hysteria, it was discovered that at least two, and possibly as many as 11, of the hijackers had used fraudulent travel documents; and one had entered on a student visa.¹⁶ Heightened scrutiny fell on nonimmigrant policies and procedures, with one U.S. Senator calling for a six-month moratorium on student visas.¹⁷ In addition, the Department of State and the INS received scathing criticism for purportedly lax oversight of their immigration responsibilities.¹⁸

The U.S. Congress amended the INA with the Homeland Security Act of 2002 that reorganized the responsibilities and duties of federal agencies involved in immigration issues. The act created the Department of Homeland Security which assumed the functions of the former INS and was mandated to establish visa policy and the oversight of visitors to United States. The Congress also passed legislation that required increased cooperation between federal agencies charged with law enforcement, intelligence and immigration responsibilities; the establishment of an entry and exit control system (U.S. Visitor and Immigrant Status Indicator Technology, or U.S.-VISIT); the collection of biometric data at consular posts; and the implementation of electronic tracking of foreign students (Student Exchange Visitor Information System, or SEVIS).

Changes also occurred in the country's visa processing system, including new security checks and procedures for individuals from countries with large Muslim populations and from countries deemed to be state sponsors of terrorism, increased use of *existing* security checks of visa applicants, and mandatory personal interviews for all nonimmigrants at a U.S. Consulate. For the most part, these changes constituted procedural, rather than policy changes.¹⁹ The visa process remained “essentially the same



today as it was prior to 9/11.”²⁰ However, the changes altered the mechanics of the visa processing system and in some respects “completely changed the playing field.”²¹

Delays and uncertainty in visa processing became an immediate concern for the academic, science, research, and business communities. Stories abounded of students waiting months for interview appointments, of students being unable to return to the United States after travel abroad, of brusque treatment by consular officials and border inspection officers, of visa renewal applications being denied, of educational and scientific meetings and conferences cancelled, and of federal research grants threatened by the absence of foreign graduate students. The U.S. Congress conducted hearings on the impact on U.S. science, education, and research, with testimony focused on visa delays and backlogs, insufficient cooperation and coordination between federal agencies, and training, staffing, and resource concerns.

A statement from more than 30 education, science and research organizations stated that visa-related problems were “discouraging and preventing the best and brightest international students, scholars, and scientists from studying and working in the United States.”²² Perhaps the “most visible change” was the drastic expansion of the interview requirement for non-immigrant visa applicants.²³ Less visible, but equally important was the expanded use of security checks on all visa applications.

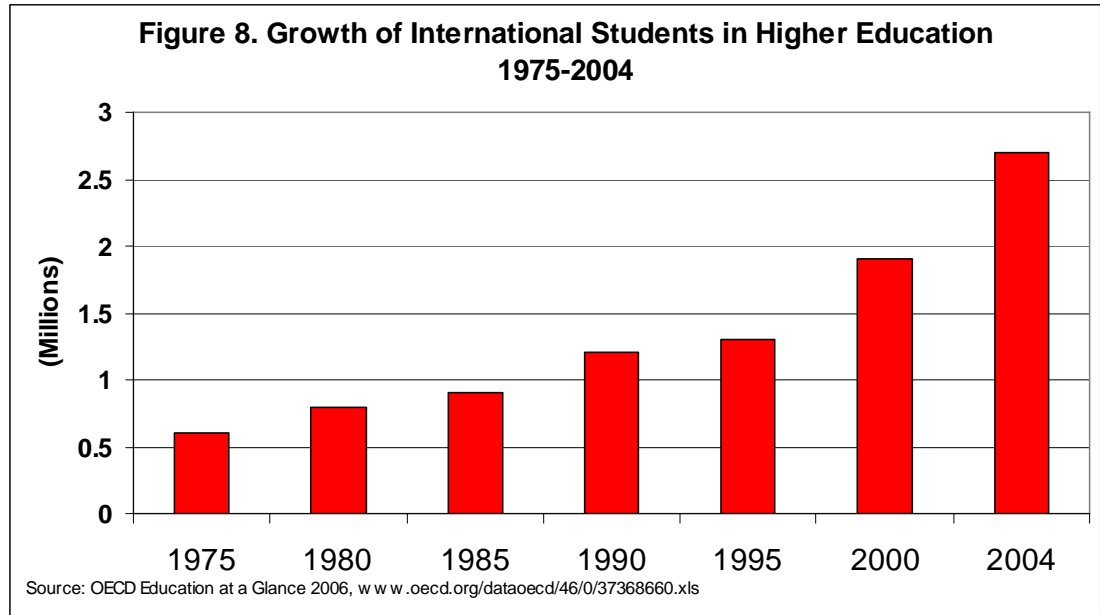
These procedural changes had an adverse impact on foreign student admissions, although as discussed above, they were not the only reason for the drop in visas. It should also be noted that many of the criticisms of visa procedures—particularly the lack of transparency in the decision-making process—were by no means new ones. The absence of an appeals process for certain visa denials (when there is a U.S. interest at stake) was cited as a major weakness in consular procedures by the US Commission on Immigration Reform in its 1997 report to Congress.

INTERNATIONAL COMPETITION: POLICIES AND ENROLLMENTS

The global marketplace for international students has been on an upward trend for the past three decades. Figure 8 shows that there was tremendous growth during the last decade with the number of international students jumping from a little over 1 million in 1994 to 2.7 million in 2004. The U.S. has traditionally been the leader in attracting the largest number of the world’s brightest science and engineering



students. However, the past decade has witnessed increasing competition for international students. Much of the competition for foreign students is concentrated in schools where instruction is carried out in English, namely the U.S., the U.K., Canada, Australia, and New Zealand which have had about half of the global international student population.



THE INTRODUCTION OF COMPETITION FOR STUDENTS ABROAD

ISIM developed a research agenda to understand the contours of the increased competition and convened a Workshop on Global Competition for International Students to facilitate a dialogue on global trends related to this issue in North America, Europe, and Asia. Researchers presented a series of commissioned papers highlighting current developments in the United States, Canada, the United Kingdom, France, Germany, India, Southeast Asia, and China.²⁴

Many of the major European and English speaking nations, other than the United States, have implemented policies explicitly designed to attract students. America's competitors have made changes in three general areas:

- (1) student admissions policies;
- (2) student outreach and university marketing programs; and
- (3) retention policies to keep desirable students in the country.²⁵



Additionally, among large nations, France and Germany increasingly provide instruction in English and have redesigned their curriculum to fit in with the more universal bachelors and masters' degree format.

In some cases, changes in admission policies have been coupled with marketing targets. For example, in 1998 France simplified its student visa procedures and in 2000, the French Ministry of National Education announced it would double the number of foreign student visas it made available. There has been a lot of educational marketing.²⁶ Some governments have created and funded NGOs to do the marketing while others have carried out the task themselves. For instance, the U.K. in the mid 1990s launched a £5 million global promotional campaign to educate 25 percent of students in the global market in English-speaking countries.

While not marketing *per se*, it should be pointed out that the U.S. provides extensive programs for potential students.²⁷ The Department of State has 450 Regional Educational Advising Coordinators (REACs) who provide information and consult with U.S. embassies, as well as extensive State Department/ECA cooperative arrangements with NGOs and others. In the wake of the visa downturn, the State Department conducted an assertive outreach campaign that has been credited with helping to turn around perceptions of visa difficulties and unwelcome.

However, the federal government has not actively marketed U.S. education.²⁸ Our interviews with stakeholders find conflicting views on a government run marketing program. Some advocacy groups believe that a government-run promotional and marketing campaign is essential to maintaining U.S. domination of the marketplace. Some university officials do not see the need because their foreign student flows are built on the prestige of their institution, and on contacts between alumni.²⁹ Then again, most other national governments have responsibility for higher education, whereas the 50 states and a substantial private sector operate in the United States.

In terms of student retention policies, most of the countries studied have recently modified their laws to allow for an easier transition from student to worker, especially for science and engineering students. This is the case for France, Germany, Australia and Canada. For instance, Australia recently amended its point system for admitting immigrants to allot extra points to students graduating from an Australian on-shore university. Canada awards points to students who stay to work in Provinces with skill shortages.

RANKING NATIONAL POLICIES AND AMERICAN'S COMPETITIVE STATUS

Arguably, by these standards the U.S. has long had in place policies that have been competitive. There have been no caps on the U.S. admission of students and visa



requirements, compared with those of other nations, have been relatively straight forward. Indeed, no one in the current debate has suggested easing educational or English requirements. And while the U.S. has had no *de facto* retention policies, in practice it has facilitated retention. All foreign students may avail themselves of year practical training after graduation, many students transition to the H-1B six-year working status, and close to three-quarters of foreign doctoral students stay for extended stays.

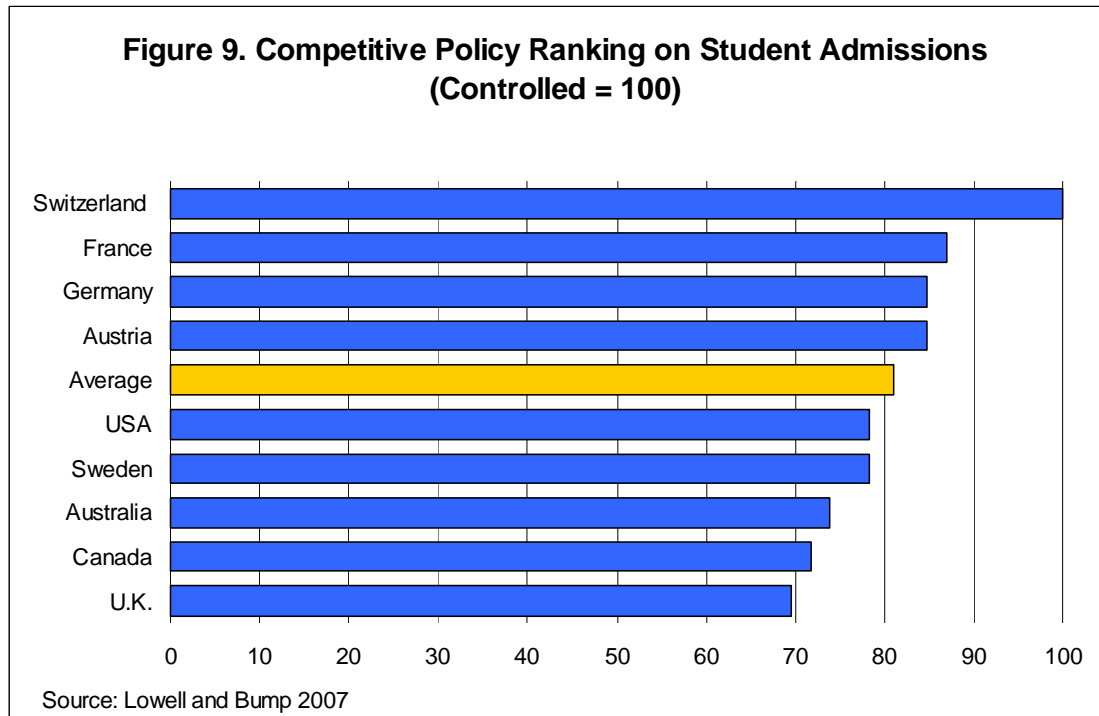
In order to evaluate the competitive nature of U.S. admission policy, we ranked the student admission policies of 10 major host nations.³⁰ First, we constructed a list of the various policy elements that govern admission with six major elements and 14 sub-elements. The major elements are allocation of numbers, screening procedures, employment opportunities, family rights, retention after graduation, and miscellaneous other requirements. Next, we assigned points to each nation's 14 separate policy elements according to whether they are very controlling or restrictive, or whether they are competitive or open (maximum of four points for highly controlled).

Today, all of the 10 countries have no numerical caps or quotas on their admission of foreign students. As far as procedures are concerned, all 10 nations require that students demonstrate an intent to return before a visa is issued; and all require proof they have been admitted to college and that they can pay their way. The U.S. appears to have the most stringent requirements for the presentation of documents by the applicant abroad, but it among the more lenient in terms of permitting student applications from within country. The 10 nations differ little in terms of the employment opportunities they offer, with the U.S. being the most open in terms of permitting employment post-graduation. All nations but Switzerland permit spouses to accompany the student, but the U.S. restricts spouse employment like Sweden whereas the U.K. and Australia permit it. The U.S. ranks very well in terms of retention, both in terms of visa avenues and particularly in terms of actual rates of stay. Finally, Australia has a mandatory health exam, while other nations are more lenient on this requirement.

Figure 9 shows how the 10 nations rank relative to each other. The points awarded are summed up and an index constructed where 100 defines the nation with the most points, in this case Switzerland, with the most controlled admission policy. This is a straightforward ranking with no differential weighting given to the six elements, albeit the number of sub-elements is a *de facto* weighting and screening procedures count heavily. At any rate, the United States is neither the most restrictive nor the most receptive nation; rather it ranks about in the middle albeit on the receptive side together with the traditional nations of immigration and the United Kingdom. This is not surprising insofar as the United States also falls toward the receptive side when ranked against a larger number of national policies for the admission of highly skilled perma-



ment and temporary workers.³¹ As a group, these latter nations have much more open policies than nations like France or Germany that are frequently thought to have changed toward a more competitive stance.

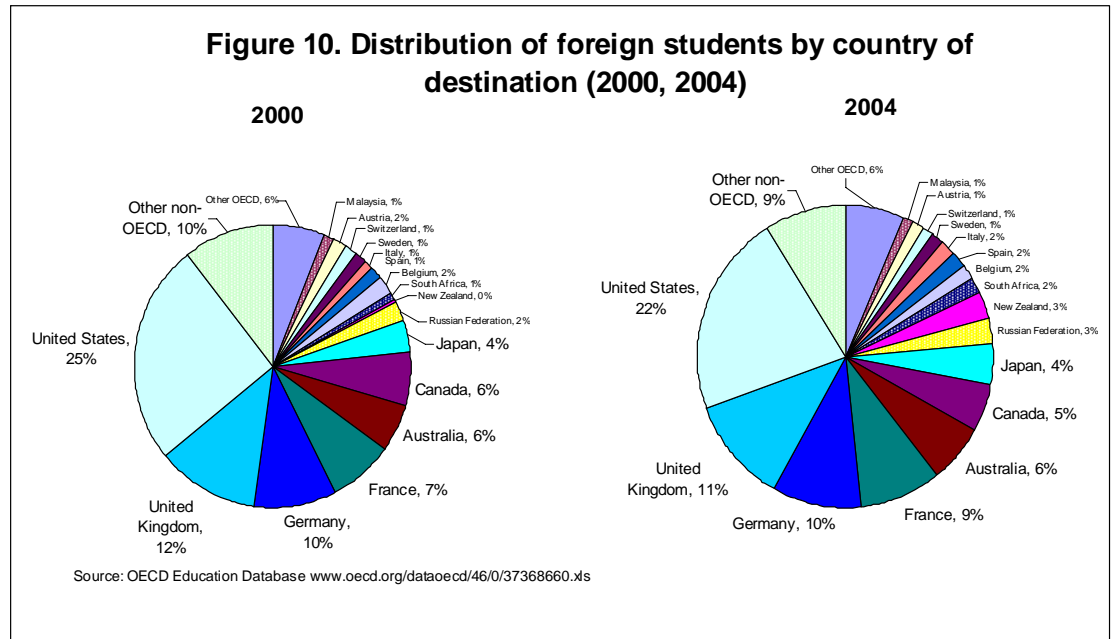


ENROLLMENT TRENDS AND THE LOSS OF MARKET SHARE

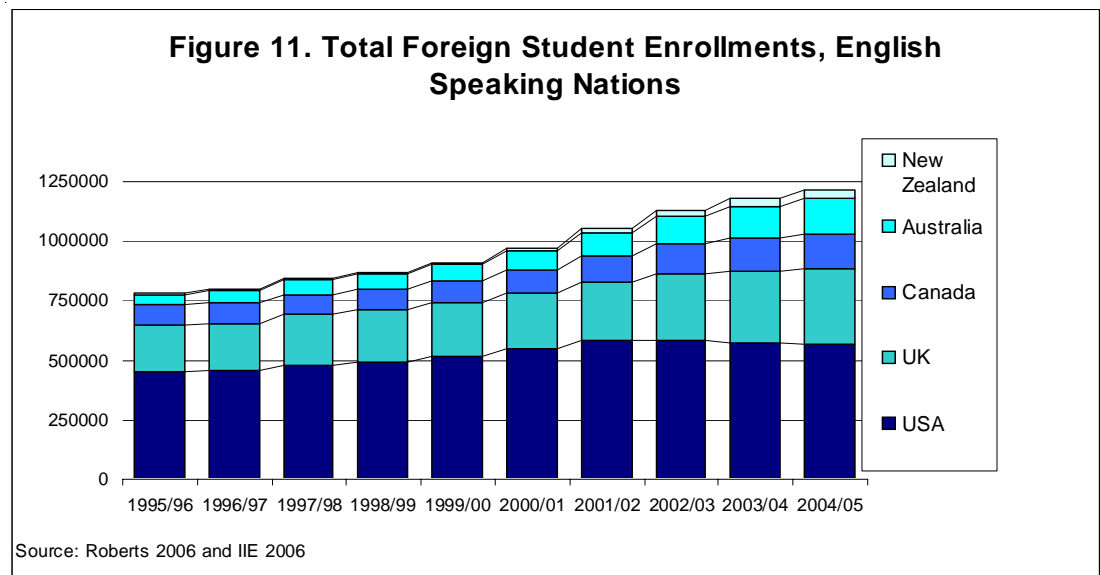
What this suggests is that the United States' student admission policies are about as attractive as those of our English-speaking competitors, although those other nations have been both more aggressive in designing competitive policies and reaching out to students. While foreign student enrollments fell in academic years 2004 and 2005 in the United States,³² they continued to increase in other major education markets. And even though U.S. enrollments did not fall markedly in the 2006 academic year, the rate of increase in many other nations has been sustained over the past several years.

Figure 10 shows that the OECD estimates that the U.S. share of the global population of foreign students fell slightly more than three percentage points from 25 percent in 2000 to 22 percent in 2004. However, there were only marginal gains in market share by any of the competitors and even some small single digit losses. For all nations, there was more stability of their share of the total than there were significant losses or gains by any one nation.

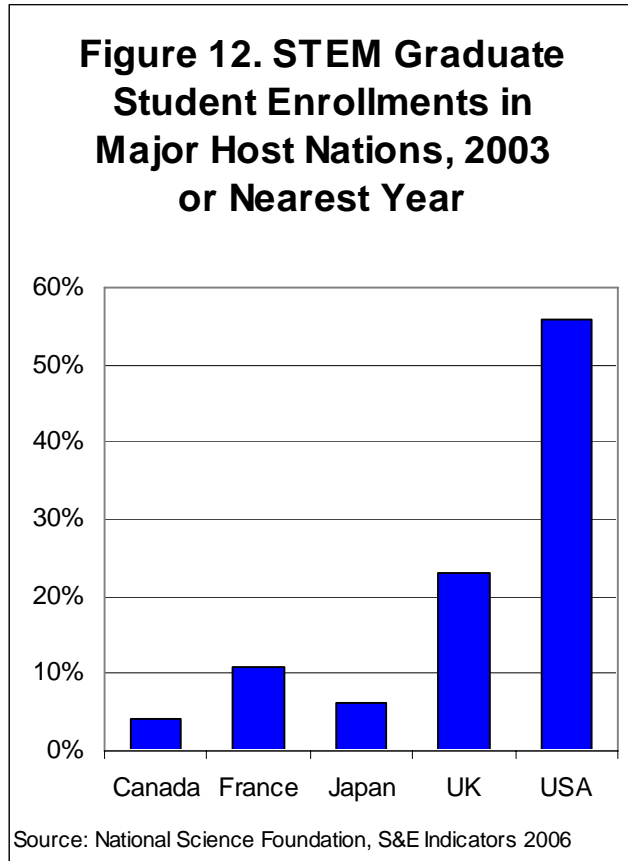




Nevertheless, America's loss of foreign students may be greatest among the English speaking nations. Figure 11 shows that foreign students in the U.S. among these nations fell a far more significant 56 to 46 percent between 2000/01 and 2004/05. At the same time, only Australia gained an advantage during this period while numerical gains by the others were marginal. The largest players, the United Kingdom and Canada, gained no more than two percentage points. Australia gained the most numerically increasing from 8 to 12 percent, although a substantial but unknown part of that increase was due to offshore education that is credited to Australia.



These figures cover all foreign students, both undergraduate and graduate, whereas many observers are most interested in graduate students. After all, graduate students have attained the greatest skill levels and may offer some of the greatest benefits if offered retention opportunities. And the U.S. loss of foreign graduate students may have been greater. One estimate suggests that, for just the English speaking nations, the U.S. share declined from about 62 to 50 percent during this period.³³ Nevertheless, Figure 12 shows that the United States still retains a commanding share of the graduate student market, especially in science and engineering.



What is more, the English speaking nations as a group saw their share of the global foreign student population decline from about 49 to 47 percent between 2000 and 2004.³⁴ So because the U.S. loss of the global total was 3 percentage points, the English speaking nations as a group only gained one percentage point of the U.S. loss; or only about one-third of the number of students that the U.S. might have otherwise enrolled. Given the much larger flow of students into the U.S., those enrollment numbers could also return in favor of the United States. The data on student visa issuances



indicates that such a rebound is now taking place. Then again, the relative losses of the English speaking nations also suggests that other non-English speaking may have attracted, and may continue to attract, more foreign students than the have in prior decades.

THE SIZE OF THE FUTURE STUDENT MARKETPLACE

Many of the major source nations are expanding their college educational systems and are educating ever greater proportions of their growing populations. Their job markets are expanding, particularly their export industries, as well as outsourcing and high technology industries. Their college graduates may be more able to avail themselves of education at home and to find employment there after graduation. Other than a projected decline in the domestic studentbody of today's host nations, there are at least three dimensions to consider in the competition for foreign students in the future.³⁵

First, the United States is not equally in competition with other English or Western nations. Over 60 percent of the U.S. foreign student population comes from Asia and another 12 percent from South America. Competition for Asians is primarily with smaller Australia, increasingly the U.K. colleges, and some Asian colleges. Only Spain has substantial numbers of South American students, but less than one third the numbers that is in America. At least half of the foreign students in Germany and other nations come from within Europe, while France or Belgium draw half of the majority of their foreign students from Africa. The market is heavily segmented and our competition is not so much with "Europe" or transitional "Asia," as it is with specific host/source nations.

Secondly, many developing nations have markedly expanded their tertiary education systems. India tripled the number of its institutions of higher education from 6,000 to 18,000 between 1990 and 2006; enrollments more than doubled from roughly 4.5 to 10.5 million during the same period.³⁶ During the recent attenuation of foreign enrollments in the U.S. between 2000 and 2004, the percentage of the college aged population enrolled in tertiary education throughout East Asia and the Pacific increased from 9 to 19 percent; that of middle income countries from 16 to 27 percent.³⁷ One can readily see that educational capacity is ramping up, as well as that the pool of students is growing.

Thirdly, econometric research indicates that increases in educational capacity in source countries, in the number of institutions and teachers, are likely to increase the flow of students to the United States.³⁸ That is primarily because student migration is strongly



affected by the promise of wage opportunities, not constraints in the domestic educational capacity of the source countries. Students from today’s low-wage, source countries appear to seek schooling in high-wage countries as a means of “augmenting their chances of obtaining a high-wage job” in the United States and other nations. In fact, increasing educational capacity prepares more students to seek education abroad. The research finds that an increase in the number of colleges and educational capacity in source countries actually increases the flow of foreign students to the United States.

Fourthly, a growing population of college-aged persons should also translate into a significant growth in the numbers of internationally mobile students, even if their migration rates stay constant. But the potential numbers will grow very rapidly if the rate of student migration increases as the research above suggests; and/or if host nations aggressively market. In nations like China and India the majority of the population is under the age of 20. The future will unfold a baby boom generation of unprecedented proportions. There are striking changes projected in the age profile of developing nations with rapidly growing numbers of persons in the college-ages. The United Nations projects that the Indian college age population 18-23 years of age today is 125 million and will growth to 139 million within one decade by 2015.

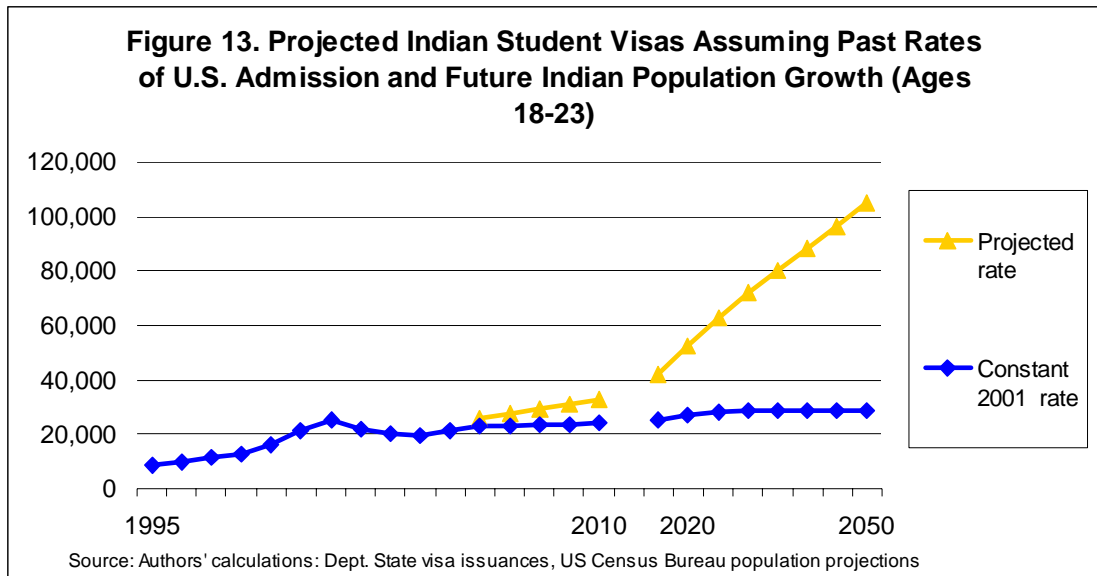


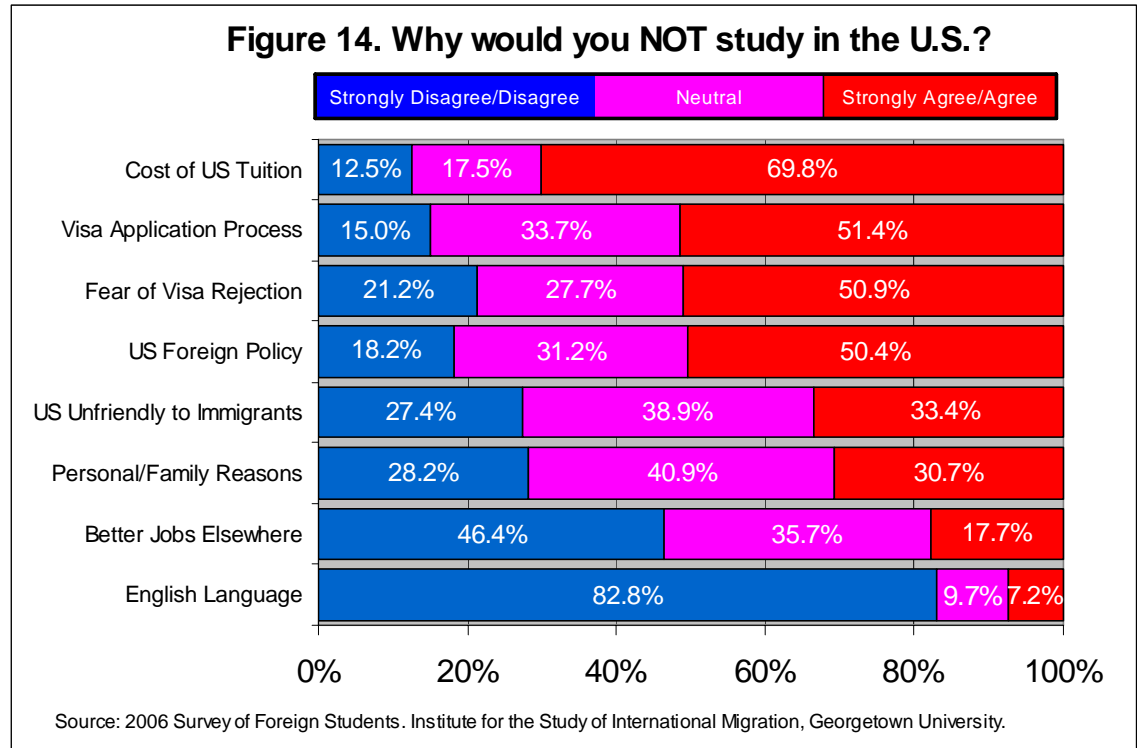
Figure 13 shows projections of Indian visas. One projection assumes that the rate of admission holds constant at the 2002 rate. The high projection assumes that admission rates grow as they did from 1995 to 2005.³⁹ The constant rate projection yields a 19 percent growth of Indian visa issuances and the high projection 91 percent growth between 2002 and 2014. In comparison, the Institute for Education Sciences projects



17 percent growth of total U.S. enrollments 2002 to 2014.⁴⁰ This suggests that the current rates of Indian visa issuances are in line with expected U.S. enrollment projections, while the high projection exceeds anticipated rate growth of the U.S. total student body five times over.⁴¹ To admit yet more Indian students should lead to questions about U.S. institutional capacity and related issues which the university system may want to consider, but which are not the direct purview of Congress.

PERCEPTIONS AND DECIDING WHERE TO STUDY

While many factors shape a student’s decision as to whether or not to move abroad to pursue higher education, their perceptions are important. We sought to better understand what affects students’ decisions of where to study. Focus groups with foreign STEM students currently in the United States were held at three major universities.⁴² Foreign students who chose not to study in the United States were contacted via email to complete an online web survey of 402 students abroad.⁴³ About half of the respondents were STEM students and half were from India and China.



Students in the online survey were asked to rank their agreement/disagreement with a number of statements about their reasoning in choosing a country to study in. Figure 14 shows that the students abroad report that the cost of U.S. tuition was the primary reason that they chose not to study in the United States. Seventy percent agreed or strongly agreed with statement that the cost of U.S. tuition deterred them and only 17 percent were neutral. Next in line were two questions about visa processing to which 51 percent of students reported strong agreement, albeit nearly a third were neutral about how these factors affected their decision. Interestingly, the difficulty of the visa application process was rated as much of a deterrent as the “fear of rejection,” which highlights the emotive power of perceptions. Other reasons related to family or jobs were much less important; and the English language was not of concern at all (even though we also introduced the survey in Chinese).

Although hardly ever mentioned by recent analysts, the deterrent effects of the cost of U.S. tuition have been recognized for some time.⁴⁴ Our findings are also consistent with those based on a survey of 11,400 students in developing nations which found that Europe was seen as being more affordable than the United States.⁴⁵ While the online survey asked just about the cost of tuition, and we demonstrate below that tuition has been escalating, the cost of education may include other things. We heard about some of these costs in the write-in part of the online survey and in our discussions with students:

High visa costs, SEVIS fees, special health insurance, and travel charges can't be met solely on financial assistance... Sitting for GRE and applying for admission to U.S. universities requires a lot of money which I found difficult to afford (Indian Male, 22, Undergraduate engineering in India).

The GRE and TOEFL are expensive, college application fees are high, there are worries about not receiving a stipend (Indian Male, 22, Graduate Civil Engineering Student in the U.S.).

Geographically, the U.S. is too far from Asia I personally do not like to travel long distances on flights and travel costs are high (Singaporean Male, 25, Graduate Student in Singapore).

A PhD in the U.S. takes bloody toooooo long (Chinese Male, 23, Life Sciences Student in the U.K.).

PhD's often take 5 years compared to 3 or 4 in Europe (German Male, 25, Graduate Engineering Student in the U.K.).

Here we can see that the various fees associated with a student application can be daunting, from the college placement exams to travel. The distance from the United



States, of course, makes airfare alone a significant cost to students in other hemispheres. The length of time it takes to complete graduate work in the United States adds another layer to the cost and it takes about 7.5 years to complete a doctorate, a year or two longer than in other nations. Once again, the structure of U.S. higher education plays a little discussed role in its attractiveness, consider Europe's Bologna process which seeks to shorten the time to graduation including a standardized three year bachelor degree.

As for the problems associated with visa processing, the student responses also suggest a variety of issues. The storylines are ones of uncertainty and lengthy, inexplicable weights for visa decisions. As mentioned above, a certain lack of transparency in visa decisions and the process of visa adjudication are not a new phenomenon, so it is distressing to hear continued problems along these lines.

One submits the same information, goes through the same interview and gets different outcomes. People are not told why they are rejected...there should be more transparency (Chinese Male, Graduate Student in Physics in the U.S.).

I returned to Lebanon and when I applied for a new visa to come back the following semester, it took 2 years to get it. For these reasons, my brother went and studied in Australia (Lebanese Male, Mechanical Engineering Graduate Student in the U.S.).

... my visa took 4 months to get approved and I got it one week before classes started. Pakistanis and other Muslim countries face particular problems. Many go to Europe, Australia, and Canada where the visa approval process is easier (Pakistani Male, Graduate Student Aerospace Engineering in the U.S.).

A lack of transparency came across in both the discussion groups and surveys. The “fear” of visa rejection, reported in the online survey, is echoed in these comments. The survey found that concerns over the fear of a visa denial were most pronounced in China, but were also substantial for students in India and Muslim majority countries. These students perceive a lack of transparency in how decisions about applicants are made. Another difficulty with the visa process has been that accepted students already in the U.S., who left, say for a holiday, sometimes faced interminable delays in getting a visa reissued. The effect of long waits is obviously detrimental and has led some students to go elsewhere.

Finally, U.S. foreign policy is ranked as much of a deterrent as visa processing in terms of potential applicants' decisions to come the United States. About half of the online students, from all countries in the sample, reported strongly agreeing with this statement. Students told us that:



I don't agree with the U.S. international politics. I don't like to live in a country that is always in war. It scares me a lot (Argentine Female, 23, Graduate Student in Physical Sciences in Argentina).

Nowadays even students are viewed suspiciously as terrorists. Always they are under scrutiny. This entirely curtails their freedom and hence their performance (Indian Male, 26, Graduate Student in Engineering in India).

We asked this question because we suspected it would affect some student's decisions. The effects of U.S. foreign policy have been lamented by some as sending a message that foreigners are no longer welcome.⁴⁶ Our survey indicates that U.S. foreign policy, and the belief that they would not be welcome in the United States, are indeed seen to be as much of a deterrent as the visa processing. Unfortunately, both potential students and some analysts often conflate foreign policy with visa policy even though these are not the same things.

Finally, the online survey suggests that students still see the United States as offering better job opportunities than alternative options for international study. Yet, the economic recession in the post-2001 period did diminish some interest in study in the United States. Our discussion with students added some nuance to this finding. One focus group participant lamented that he had applied to several companies for his year of optional practical training and had received no responses.

The U.S. economy is sliding and there are very few job opportunities (Indian Male, 26, Graduate Student in Engineering in India).

The job scenario in my home country is improving a lot so people prefer to stay in India... With the strengthening of Indian economy and higher standards of living available in India, people are more happy and satisfied to settle here (Indian Male, 21, Undergraduate Student in Engineering).

The cost of foreign student study in the U.S. is exacerbated if post-graduate jobs are uncertain; jobs are seen as a way to not just pay off loans but also to add needed experience to the resume in order to advance in one's profession. Countries such as India and China have experienced tremendous economic growth and there is a growing perception that pursuing education at home makes sense for making one's career at home.

Student decision making includes many factors, including those that are immediate such as relative costs and those that are less immediate such as word-of-mouth reports about other students' experiences with visa applications. These latter events create



perceptions about reality that may have little relevance for what any given student would experience on their own. Perceptions should in no wise be downplayed. The eminent sociologist W. I. Thomas noted that if “people define situations as real; they are real in their consequences.”⁴⁷ It is not remarkable that students identified visa processing as important but secondary to bottom line costs. Rather in the world of perceptions, the lack of transparency in the awarding of a visa—an unknown risk of rejection—appears to compound the primary concern about U.S. tuition costs.⁴⁸

THE ECONOMICS OF WHERE TO STUDY

The cost of an education increased in the United States between 2001 and 2005 due to steep increases in the tuition that colleges charge. At the same time, the recession undercut the ability of foreign students to defray their costs by working, either on or off campus. Unemployment soared particularly in those occupations that students most found employment in after graduation. The long-running “jobless recession,” and that poor prognosis for employment, continued to be felt through 2005. Ironically, the fact that so many foreign students banked on jobs as a temporary H-1B visaholder, and jobs in information technology which were particularly hard hit after the bubble burst, undermined the attraction of studies in the United States.

THE HIGH AND INCREASING COST OF A U.S. EDUCATION

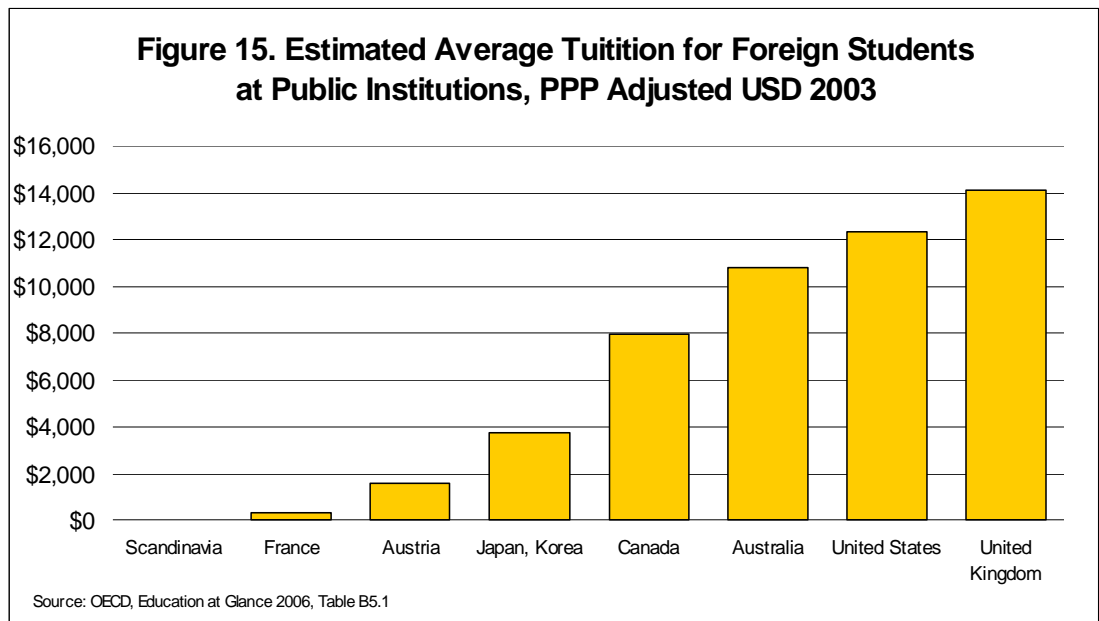
The fact that the cost of education is very important should not come as a surprise because foreign undergraduates are required to pay for their own college costs and must demonstrate that ability before admission. Most foreign undergraduates have family resources or take out loans just like domestic students. Graduate students, on the other hand, frequently pay their way with grants or by working as teaching or research assistants in college campuses. For students coming from lower-income countries, the greatest and growing share of international students, the cost of education is obviously central to their ability to pursue education abroad.

Our research shows that the relative cost of education has a substantial effect on students’ choice of whether and where to study. An econometric analysis, undertaken for this project, analyzed post-1980 student migration to Canada.⁴⁹ It found that the price of a Canadian education, adjusted for exchange rates in source countries, had no real impact on the flow of students to Canada, e.g., the choice to study in Canada in and of



itself is like a “luxury good.” However, if the Canadian costs are combined with the comparative cost of education in the United States, it is estimated that a ten percent rise in Canada’s domestic education price will lead to an 8.4 per cent decline in foreign student enrollments.⁵⁰ This type of model is capturing relative changes in costs, but clearly it costs more on average to study in the United States than many other countries.

Figure 15 shows estimates of the average cost of tuition in several nations at public institutions. In the United States about three quarters of all foreign students attend public institutions. Those costs are adjusted for purchasing power parity (PPP) or the relative cost of living in each country. These estimates also include the average cost of institutions with graduate schools. The United Kingdom is the costliest nation; next in line is the United States, and then Australia. The cost of tuition tends to be much less in many European nations because higher education is heavily subsidized by the government.

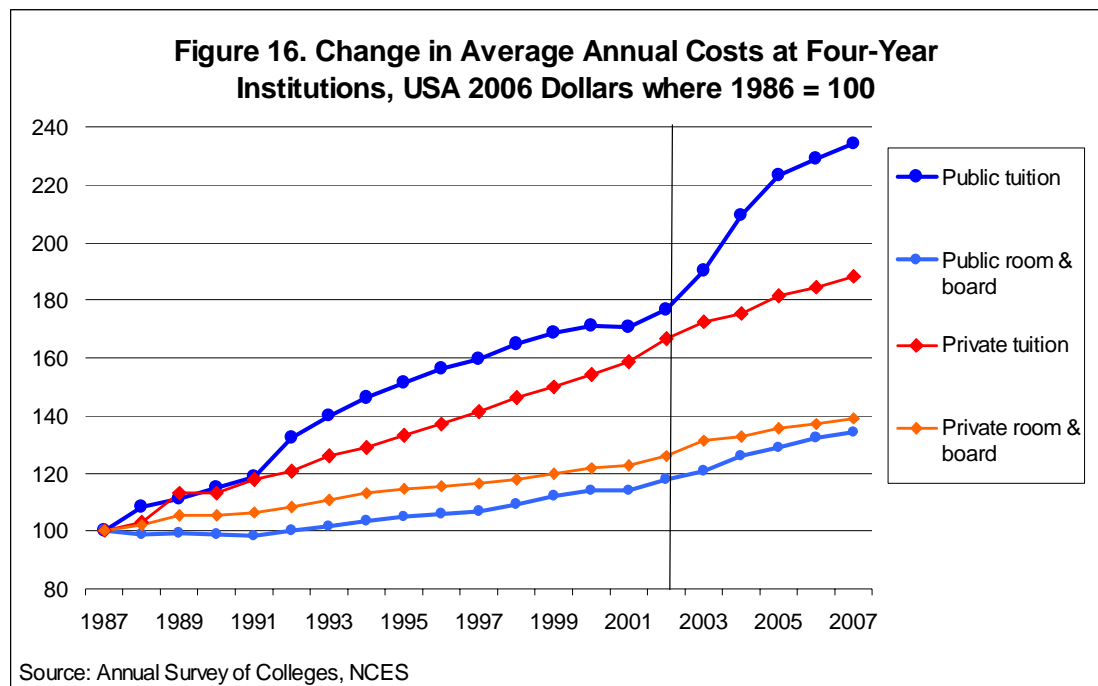


Subsidized tuitions make foreign students a real money maker when, in the case of England, colleges are permitted to charge more for foreign students who pay up to ten times as much as U.K. students. Most U.S. public colleges also charge foreign students more than in-state students, while many European nations charge foreign students the same as domestic students. Scandinavian countries and Germany actually charge foreign students no tuition at all. Such differences in treatment contribute to the relatively greater cost of studying in the United States.⁵¹



When the cost of higher education at private U.S. institutions is taken into account, the U.S. is the costliest nation. American private universities are among the costliest in the world and they are significantly more expensive than the public universities. In 2006, private university tuition was almost four times as expensive as public tuition (\$22,200 and \$5,800 respectively for four-year institutions). Regional differences vary with the differential in the mid-west being the least and the west being the greatest.⁵² Perhaps the low costs in the mid-west help explain why this region has one fifth of the foreign student body.

Not only are tuition costs at U.S. colleges relatively high, they have been sharply increasing during the last several years. Public institutions in particular, where most foreign students are found, show a surprisingly increase in tuition costs precisely during the period when student applications fell most from 2002 to 2004. Figure 16 shows the trend in tuition costs for public and private institutions from 1986 to 2006 which have been increasing constantly, adjusted for inflation, over the twenty year period.⁵³ The sharp increase in public tuition costs from 2002 to 2005 averaged 7 percent yearly, or 60 percent more than the annual average of the entire two decades. In contrast, private institutions raised tuitions at about 3.4 percent from 2002 to 2005; an increase in line with its long term trend.



If the elasticity of demand for foreign visas relative to tuition costs in the United States were anything like that estimated for Canada, it would imply that this jump in costs may have had a substantial impact. Indeed, a 7 percent increase in costs would have reduced student numbers by 6 percent, or a substantial fraction of the decline in visa issuances actually experienced.⁵⁴ This is a very rough estimate and it begs for an econometric evaluation based on U.S. data. It also suggests that the relative cost of a U.S. education and the recent spike in costs play a significant and too often downplayed part in the U.S. competitive posture.

STUDENT EMPLOYMENT AND RECESSIONARY IMPACTS

Additionally, the impact of the economy in the United States has played a role because it affects students' ability to land jobs during and after graduation. While the 2001 recession officially began in spring of 2001, unemployment began to increase in the fall of 2000 and continued to increase through 2003. Unemployment rates then began to decline, but did not return to pre-2001 levels until 2006. This so-called "job-less" recovery affected all job seekers and the prognosis for future employment is seen by some as gloomy.⁵⁵

A recession's major impacts may be off campus jobs, but it also affects academia and foreign students.⁵⁶ The parents of most foreign undergraduates are their primary source of funding, although many may work part time to help defray costs, while perhaps most foreign graduate students work in one capacity or another.⁵⁷ Foreign students are permitted to work on campus and, after graduation, may choose one year of optional practical training off campus (OPT).⁵⁸ Perhaps as many as half of foreign graduates continue on OPT, but there are no readily available statistics and the Institute for International Education has only recently begun publishing information on OPT. However, it is reasonable to assume that the proportions of students working both on campus and on OPT are nontrivial. Most graduate students, at least in S&E fields, work on campus before graduation and a majority may work off campus thereafter.⁵⁹

Many students transition to either another temporary visa or even a permanent visa after graduation or optional practical training. One reason other nations are implementing retention policies is that there are appealing reasons, at the least for the student, for longer-term stays. Students may wish to pay off their education, build their resume, benefit from U.S. working conditions, or enjoy U.S. life and culture. Some marry a U.S. citizen. These diverse motivations exert a powerful pull. Advocates argue that the U.S. benefits because foreign graduates of U.S. institutions are primed to integrate and they benefit U.S. employers. Others argue that the transition to a temporary



working visa prolongs the integration of potential immigrants, creating a class of “probationary” Americans.⁶⁰

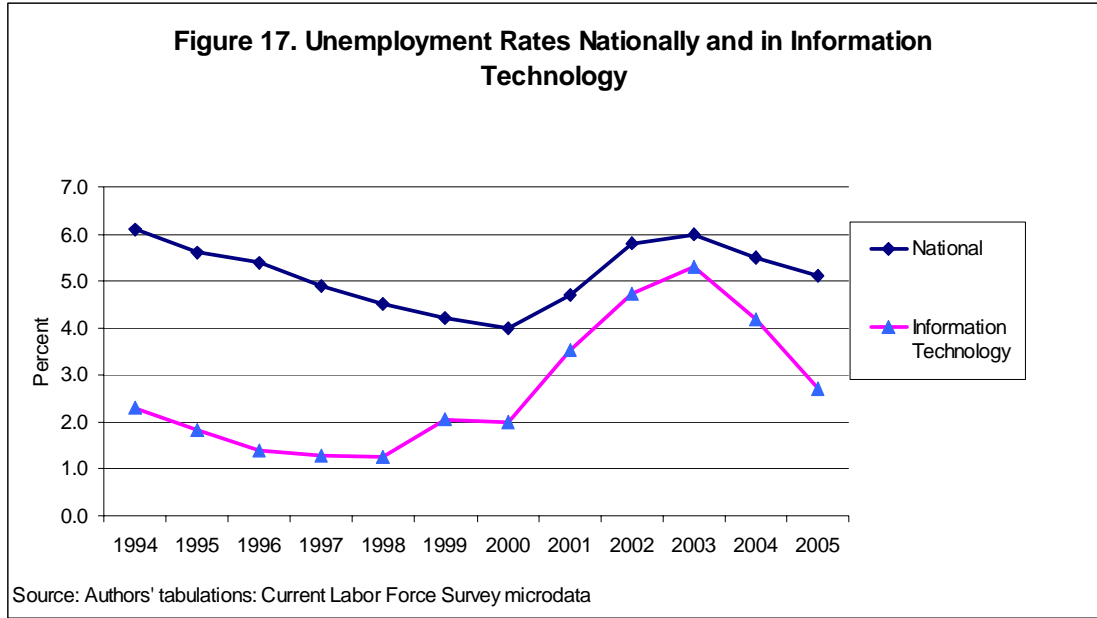
The Immigration Act of 1990 set in play policies that have facilitated students’ desires to stay. It increased the number of permanent slots available from 65,000 to 140,000. It refashioned the temporary work-authorized H-1B (specialty worker) visa that is issued to individuals who fully intend to later adjust to permanent status. Students who entered during the 1990s took advantage of these new avenues. Albeit the H-1B became preferable simply because its issuance is less rigorously monitored and takes weeks, while the issuance of the permanent employment-based visa has taken several years.⁶¹ Students’ routes to permanency changed over the 1990s and became more tightly linked to the labor market and the H-1B visa.^{62,63} By the late 1990s a greater proportion of students stayed after graduation and most transitioned to the temporary H-1B visa. Between 1999 and 2003 on average, an estimated one third of foreign masters and nearly two thirds of doctorates stayed in the U.S. after graduation.⁶⁴ Of those staying, nearly three quarters transitioned to the temporary H-1B visa with a far lesser one quarter adjusting directly to permanent status. This represents a sea change in the share of foreign students staying in the United States, as well as the routes that they take.

The impact of the U.S. recession on jobs figured more prominently in students’ calculus at the end of the 1990s because so many stayed to work. Figure 17 shows that national unemployment jumped in 2001 as did unemployment in information technology (IT) where unemployment more than doubled in a historic break with the sector’s past of very low unemployment. To be sure, unemployment jumped in other STEM fields, but even engineering rates were more than a percentage point less than IT and Life/Physical sciences did not exceed historical rates. Furthermore in 2001, at the outset of both the recession and the decline in student visa applications, 58 percent of H-1Bs were employed in IT jobs, a small percentage in engineering, but comparatively few in Life/Physical sciences. A large share of employment-based visa holders also worked in IT jobs which had been a rapidly growing field and attracted many foreign students and workers. The largest supply came from India and China; and fed disproportionately in IT employment.

It should not be surprising that unemployment so quickly affected many students considering applying for a U.S. education. All students are known to factor potential employment into their calculus of field of choice and it takes little leap of logic to understand that foreign students also consider their employment options.⁶⁵ Further, foreign students from developing countries often do not to rely on formal student loans and employment may figure prominently in the plans. So when unemployment



spiked in the United States, it undermined the plans of many students who determined to wait and see what happened.⁶⁶ With the magnitude of the spike in IT unemployment unsettling enough to domestic workers, the stories filtering back to potential students would have been truly unnerving.

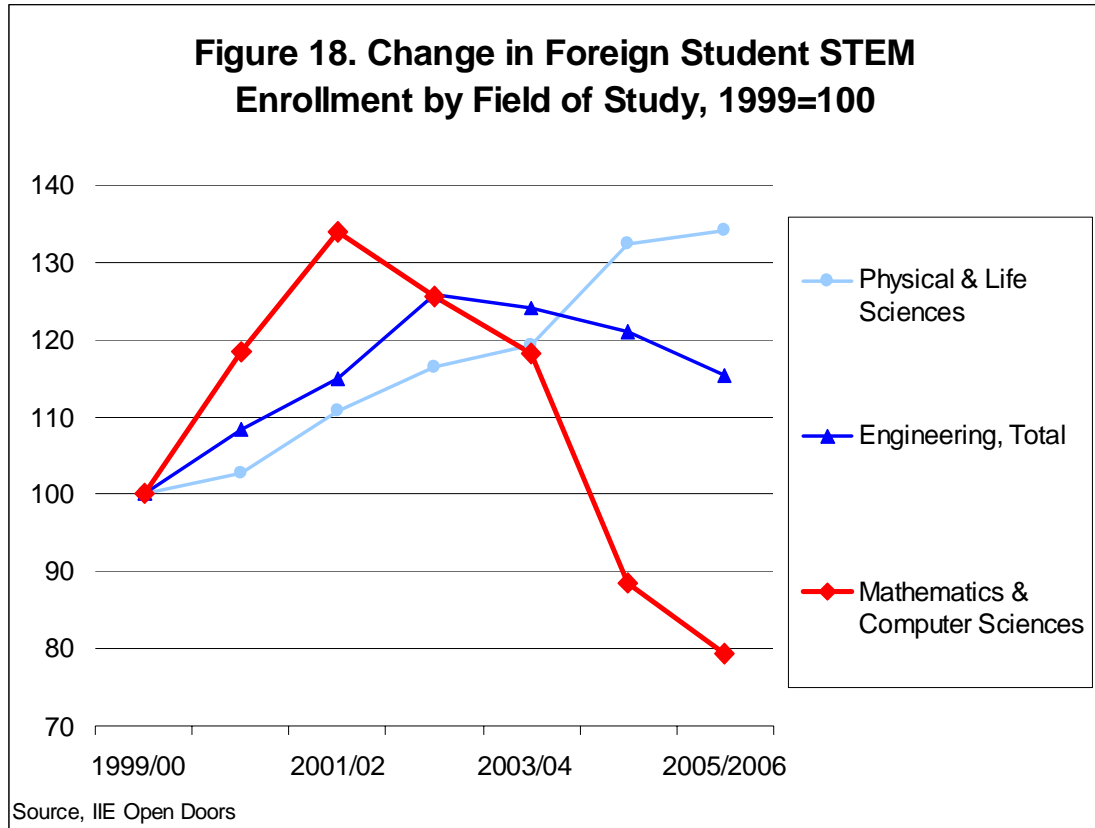


The impact of the recession can be readily seen in data on foreign students by field of study shown in Figure 18. Not all STEM fields were impacted equally; rather the greatest drop in student enrollments was precisely in the computer sciences. Foreign student enrollments in the computer sciences dropped extremely steeply after 2001 and continued to do so right on through 2006. Engineering enrollments were impacted too, but much less so that computer science enrollments. Perhaps the engineering students most impacted were those planning to bridge over into a computer-related job, a not unusual job path. The greatest declines by national origin were China and India, the origins of students most likely to plan on these fields of study.

At the same time, student enrollments continued to increase in the life and physical sciences.⁶⁷ These fields of study are those most sensitive to heightened security concerns and, yet, the stepped up scrutiny impacting students in these disciplines apparently little affected their plans to pursue studies in the United States. This is a potentially telling evaluation of the impacts of visa procedures on the downturn. But then too the job market apparently had little effect and that is likely because these are small job markets which were not as adversely affected. Life and physical sciences also tend to require a doctorate degree where other STEM fields do not, so the planning horizon is



longer and enrollments are not as immediately affected. Indeed, among graduate students engineering experienced by far the greatest decline of applications, while the physical sciences experienced an increase, but declines among graduate students were otherwise across the board.⁶⁸



Although 9/11 and its aftermath contributed to the drop in student numbers, too often analysts use the event as a catchphrase, substituting for the broader set of events. Consequently, little thought is given to the simultaneous impact of the 2001 recession and its impact on foreign students. While foreign students may be able to meet the requirements of the student visa, i.e., that they are able to pay for their education, the manner in which they pay for that education is more complex than simply loans or grants from home. Their families may pay much of students' costs, as families do everywhere, but students may plan to repay their families as immigrants through the time honored means of remittances. Part time employment can also help defray the high costs of U.S. education as does the prospect for post-graduation employment. In short, foreign students are aware of job opportunities in the United States and plan accordingly.



CONCLUSIONS AND POLICY RECOMMENDATIONS

Observers of the decline of foreign student numbers in 2001 rushed to the conclusion that America's "immigration policies" deterred foreign students—either because 9/11 tightened security procedures deterred applicants, or because our admission policies are not as attractive as those of new competitors. While critics acknowledge that many factors may have impacted the flow, the emphasis on policy failure has been, and remains, front and center.

While acknowledging that visa procedures in the immediate aftermath of 9/11 deterred potential applicants, our analysis suggests the importance of other causes. In fact, the basic elements or architecture of U.S. student admission policy is competitive compared with other nations and we concur with expert analysis that differentiates American's policy framework from visa procedures.⁶⁹ This is not a trivial distinction when turning to conclusions and recommendations.

We conclude with others that there were, indeed, many factors behind the decline. But we do not consider factors often cited in this debate, such as new competitors, to have been primary. Rather, we believe that the economic factors of recession, jobs, and college costs are overlooked and primary factors. Of course, these conclusions lead us to be reluctant to forecast ongoing losses, an analysis reinforced by the thus far short-lived increase in student admissions. We also forecast a marked expansion of the population of, or market for, foreign students and; therefore, far less alarm about reductions in America's market share.

These sets of conclusions lead us to different policy recommendations than those reached by many in the debate. We do not perceive a need for a complete overhaul of student admission policies, particularly the creation of new visa classes or streamlining the retention of foreign students. At the same time, we are not sanguine that recent improvements in admission procedures are a sure thing. There will need to be continued attention to procedures by all agencies involved including the anticipation of future crises and appropriate responses. This will require not simply forward looking management thinking at the major Administrative agencies, but the cooperative involvement of academic stakeholders.



THE PERFECT STORM ANALOGY

We attribute the decline to the confluence of several factors that, more so than in a typical cyclical phenomenon, reinforced the effect of each other—a perfect storm where security procedures compounded the situation:⁷⁰

The rapid implementation of pre-existing visa procedures after 9/11 created a regulatory environment that chilled, but did not “restrict” student applications. The relative number of applicants subjected to increased scrutiny was very small. Rather, the contagion effect of stories of visas denied, or of interminable waits, generated *perceptions* of difficulties out of proportion to individual reality—a phenomenon that should not be downplayed for its ultimate impacts. In fact, those perceptions, when combined with individual experience of a *lack of transparency* in visa adjudications, created a chill that heightened the impact of cyclical factors.

The 2001 economic recession hit source countries hard, reducing the ability of potential applicants to afford higher education at the same time as the cost of U.S. education spiked and work opportunities in the United States declined. Like the previous 1982 trough in visa issuances, a global economic recession had a large impact on the downturn. In fact, the events of 9/11 took place in the wake of the recession of 2001 and in the midst of a long-running jobless recovery. It is more precise to say that the downturn occurred after 2001, not after 9/11 as written by so many observers. Econometric analysis shows that national levels of per capita income are an important driver of student migration.

Our surveys of foreign students find that the high cost of U.S. education is the greatest deterrent to choosing a U.S. education. Visa processing problems are secondary in those students’ views; and we interpret their fear of visa rejection as part and parcel of their concerns about a lack of transparency in visa adjudications. These twin findings support our analysis that economics plays a central role in student decision making. Individuals pay a lot of upfront costs in applying for a visa, to say nothing of strategizing for longer-term resources, and the expected cost of application is markedly increased if the likelihood of success is unknown.

The cost of public education soared to 7 percent annually 2002-2005, more than twice the average rate of annual increase over the previous two decades. About two-thirds of foreign students are enrolled in public institutions; the other third enrolled in private institutions did not face unusually steep tuition hikes. But U.S. private education costs were increasing and are among the costliest in the world. Econometric research on Canada finds that relative schooling costs significantly affect student migration and it can be assumed to affect the U.S. market as well.



Many foreign students have come to rely on U.S. employment to defray their college costs and the U.S. recession and jobless recovery affected those prospects. While we have no reliable figures on foreign students who work, many do so. Further, over the course of the 1990s an increasing percentage of students stayed after graduation and many transitioned to a temporary or permanent employment visa, most often in the booming field of information technology. Knowing that, it should come as no surprise that the dot.com bust deterred potential students particularly in the fields of IT and engineering.

Regional trends in the student visa issuances show a variety of patterns, many of which suggest economic and/or political shocks that preceded 2001. Whatever visa processing problems affected South American students, they were compounded by policy and economic shocks in major source countries. In many Asian nations, Muslim and non-Muslim, the 1997 Asian crisis had already precipitated a decline in student numbers, which many had not overcome, while leaving others vulnerable. The clearest “9/11 effects” appear in the Muslim, middle-east nations like Saudi Arabia which, nevertheless, are now rebounding smartly.

The increasing international competition led some students to opt to study in countries other than America, but the short-term impact was not large. America’s share of the global student body declined very little during the recent downturn, although its share of students in English speaking countries declined more dramatically. At the same time, the English speaking countries as a group lost a small share of the global student body. So there is no simple story that America’s English competitors stole America’s students. And the U.S. still has twice the share, at 22 percent, of the entire global student body compared with England its nearest competitor. American still enrolls the majority of graduate students especially in STEM fields.

There will be increasing international competition over the longer term, but insisting on America’s market share misleadingly defines foreign students as a dwindling resource. The U.S. benefits from foreign students, but there is no cogent argument that it must dominate on the basis of proportional enrollments. As there is likely to be a growing number of students globally, a policy in the national interest would be to compete for the most qualified. Many students in the growing college-age populations in source countries will opt to remain home or study in lower-cost countries than America. But econometric research suggests that source countries’ increasing number of students and institutional capacity will generate a growing number of students seeking education abroad.



POLICY RECOMMENDATIONS

- *Visa policies and procedures should be more transparent, efficient and adhere to recognized standards.* Along with most stakeholders, we acknowledge that the U.S. Department of State has made notable strides in coordinating interagency procedures and improving its consular functions. However, potential foreign students continue to voice concerns about transparency of visa adjudication and there is room for improvement.
- *In the interest of greater transparency, visas for foreign graduate students should include a dual intent provision.* The high rates at which foreign students obtain H-1B visas and/or adjust to permanent residence belie current legal provisions that preclude admission of those who intend to remain in the United States. Access to post-graduate employment appears to be one of the attractions of the United States for foreign student applicants, and they appear to be attractive employees for many U.S. companies. U.S. immigration policy should recognize this reality and acknowledge that many foreign students indeed intend to remain after graduation.
- *The Departments of State and Homeland Security should engage in regular evaluations of their current procedures, as well as managerial assessments of future scenarios and responses.* Any well-run business is continually evaluating its services. The point of the Government Performance Results Act of 1993 is precisely to institutionalize such evaluation. At least part of the problem in the stepped-up implementation of existing regulations post 9/11 was a lack of such ongoing evaluation and, hence, an inability to precisely identify managerial responses. Now in the post 9/11 era, forward looking management should game future scenarios and devise appropriate responses to be prepared beforehand.
- *Cooperation between government agencies and academia should be expanded.* The government does not stand alone in creating the immediate post 9/11 procedural problems. The academic sector dragged its feet on implementing a student tracking system and the rapid implementation of SEVIS generated more problems than it would have otherwise. While there continue to be problems with SEVIS, we talked with few academic stakeholders who now believe that SEVIS is uncalled for.
 - ▶ *SEVIS needs refinement, especially on technical aspects of changes in students' academic or visa status.* This challenge is being addressed by Homeland Security and the academic sector needs to be made a full partner.



- ▶ *Student advisors need to recapture their role as student advocates.* Some stakeholders feel that the student advisors role as counselors has been diminished by the time and monitoring requirements of SEVIS. It is possible that the improving functioning of SEVIS will ultimately require less time by student advisors in data processing or monitoring of student status. However, returning the balance of that counselor role should be a priority.
 - ▶ *The many overlaps between non-government organizations, academic, and government are welcome and should be enhanced.* Additionally, stakeholders might be included in regular, systematic evaluations of student procedures. They might also play a role in future scenario exercises.
- *Student optional practical training should permit two years of work authorization.* Foreign students are now permitted just one year of OPT, while the regulations used to permit two years. An additional year of OPT would help students defray their educational costs.
- ▶ *The impact of the 2001 recession may have been particularly hard precisely because the policies of the 1990s, combined with the dot.com bubble, significantly altered the portfolio of options open to foreign students.* If U.S. higher education wants a stable source of foreign students, one implication may be that enrollments not be determined by prospective access to temporary work visas. Rather, student employment might be facilitated during their studies or by post-graduation optional practical training.
 - ▶ *Student spouses should be permitted to work off campus in jobs certified not to displace native workers.* A few other nations now permit spouses to work and our analysis suggests that it would be attractive for applicants. This is one way to meet a demand for young workers who are likely to be as well educated as their spouses. It would help students defray the cost of their education. It would also be less costly than funding special grants, etc.
- *The path to permanent residence should be eased for foreign student graduates who remain in the United States.* Legislation has been proposed that would increase access to H-1B visas for foreign students. Facilitating student transitions to a temporary working visa may appear favorable, but it is not always in the student's or the nation's best interest. The rapid integration of immigrants is in the nations' and, arguably, in students' best interests. Transition to a temporary visa extends the period before students may apply for permanency and, if time to degree is first

factored in, can extend the period of “pre-citizenship” by a decade and more. The creation of a class of probationary Americans is not in the national interest.

- *National debate is needed on the role of the federal government in fostering the competitiveness of the United States in attracting and retaining foreign students.* Some questions to address: Should the federal government provide subsidies or loans to offset high tuition and living costs, and, if so, at what level of education (graduate and/or undergraduate level)? Should the Federal government play a greater role in



marketing to international students? What is the role of dual intent and what are the pathways that students follow in adjusting to permanent residency?

ENDNOTES

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2. At the same time, enrollments in business and other disciplines declined (IIE, Open Doors, Data Tables, <http://opendoors.iienetwork.org/page/28633/>).
3. Data for the year 2002 (NSF, S&E Indicators 2006, Appendix tables, http://www.nsf.gov/statistics/seind06/pdf_v2.htm).
4. Lowell, B. Lindsay, 2006. "Projected Numbers of Foreign Computer and Engineering Workers under the Senate's Comprehensive Immigration Reform Act (S.2611)," Working Paper Institute for the Study of Georgetown University.
5. Refugee admissions as students were removed from the student visa counts in the 1980s, but their numbers were too few to account for the observed decline and do not correspond with its timing.
6. Domestic restrictions on political and civil freedoms have been shown to reduce emigration to the United States and Canada. See Karemera, David; Victor Iwuagwu Oguledo and Bobby Davis, 2000. "A Gravity Model Analysis of International Migration to North America," *Applied Economics*, 32(13): 1745-55.
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8. Krepps, Sarah Krepps, Lowell, B.L., Gustavo Flores, and Mark Rom, 2005. "Consular Affairs Futures Study," Report by Change Navigators to the U.S. Department of State, Bureau of Consular Affairs, Washington, D.C.
9. The national refusal rate is measured for all non-immigrant visa applications for 171 nations. Those data are from another analysis of non-immigrant visa applications (Krepps et al. op cit.). Data for student visa refusals are not available. It can be expected that national visa refusal rates and student refusal rates are highly correlated. Nevertheless, a regression approach would be preferred because of the possibility of simultaneity in the application/refusal relationship (which is why a one-year lag is used here), as well as omitted variable or estimator bias (and a weighted regression might be preferred given large differences in the number of

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- A1.4). It would be as quixotic to imagine that immigration could resolve that “loss” as it is to imagine that immigration can replace the growing number of dependent persons created by population aging; see Meyerson, Frederick A. B., 2001. “Replacement Migration: A Questionable Tactic for Delaying the Inevitable Effects of Fertility Transition,” *Population and Environment*, 22 (4): 401-409.
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 41. Even at current rates of growth some observers expect that Indian students could make up as much as one third of the U.S. student body within just a few years (Agarwal op cit.).
 42. The ISIM research team conducted focus groups at the University of Southern California, the University of Maryland-College Park, and George Mason University.
 43. The ISIM web survey was conducted using SurveyMonkey.com, a web survey company that allows researchers to create, edit, and analyze surveys (<http://www.surveymonkey.com/s.asp?u=490561694414>). Foreign-student organizations at universities in Canada, the U.K., and Australia were contacted, published email lists of students were used for Canada, Australia, the U.K., India, China, Hong Kong, Singapore, and Korea; and faculty were contacted and asked to distribute the survey in Singapore, India, and China.
 44. Schneider 2000 op cit.
 45. Academic Cooperation Association, 2004. “Perceptions of European Higher Education in Third Countries,” Project 2004–3924 / 001–001 MUN-MUNA31 (<http://ec.europa.eu/education/programmes/mundus/acareport.pdf>).
 46. Paden, John, Peter Singer, “America Slams the Door (On Its Foot): Washington’s Destructive New Visa Policies,” *Foreign Affairs*, May/June 2003.
 47. Thomas, W.I., 1928. *The Child in America: Behavior problems and programs*, New York: Knopf.



48. In fact, students may consider visa processing hassles just part of the game and weigh many other factors more heavily. A study of students at Columbia University asked students about the length of time it took the before a visa was awarded, and that varied two days to more than two months. They also asked students what their primary complaints were about the entire process of coming to America. Almost uniformly, visa time aside, the greatest complaint was the housing situation at Columbia and only one student complained about visa hassles; see Columbia University, 2005. New International Graduate Student Survey Fall 2005, International Students and Scholars Office (ISSO)(<http://www.columbia.edu/cu/isso>).
49. DeVoretz, Don. 2006. “The Education, Immigration and Emigration of Canada’s Highly Skilled Workers in the 21st Century” Prepared for the meeting Global Competition for International Students, March 31, 2006, Institute for the Study of International Migration, Georgetown University, Washington DC.
50. A change in cost induced via either currency appreciation or a tuition increase or both; see DeVoretz, Don. 2006. “The Education, Immigration and Emigration of Canada’s Highly Skilled Workers in the 21st Century” Prepared for the meeting Global Competition for International Students, March 31, 2006, Institute for the Study of International Migration, Georgetown University, Washington DC.
51. OECD (2004), *Internationalization and Trade in Higher Education*, OECD: Paris.
52. Annual Survey of Colleges, the College Board, New York, NY. (<http://www.collegeboard.com/highered/res/asc/asc.html>).
53. Prices in 2006 dollars, unweighted by enrollment size.
54. This is a rough, order of magnitude estimate conservatively demonstrated against the drop in visa issuances or the flow. Yet, because DeVoretz’s (op cit.) estimate is based on enrollments, the cost shock would actually explain most of the implied drop in U.S. enrollments.
55. While the U.S. Department of Labor projects a slowing in the rate of increase of information technology jobs over the next decade, Gartner forecasts that IT employment will decline by 15 percent. Forrester projects that 26 percent of IT jobs will be gone by 2015 (IT Facts, <http://www.itfacts.biz/index.php?id=P3426>).
56. Paradoxically, native enrollments often increase during a recession given the opportunity cost of schooling relative to unemployment. Even if the numbers of on-campus jobs are not heavily impacted, there may be increased competition for those jobs.
57. Two-thirds of *all* foreign students report their parents as their “primary” source of funding, a little less than one quarter report their college, and only about two percent report current employment (IIE, Open Doors, Data Tables, <http://>



opendoors.iienetwork.org/?p=28633). These data do not differentiate by undergraduate or graduate status, nor does it tell us how many students work to supplement their primary source of funding.

58. Students who face unforeseen financial difficulties, and when no jobs are available on campus, are permitted to work off campus. After their first year, students may also work on campus but it counts against their year of OPT. Data on students working is not readily available. For rules and limited data from SEVIS see (http://www.ice.gov/sevis/numbers/archive/2004/3rd_quarter/index.htm).
59. About 7 percent of students enumerated in the U.S. in 2006 were on OPT which is equivalent to half of all foreign MA and PhD graduates in that year (IIE, Open Doors, Fast Facts 2006). See also North, David S., 1995. *Soothing the Establishment: The Impact of Foreign-Born Scientists and Engineers on America*, Lanham, MD: University Press of America.
60. Park, Edward J.W. and John S.W. Park. 2005. *Probationary Americans: Contemporary Immigration Policies and the Shaping of Asian American Communities*. New York: Rutledge.
61. The number of H-1B visas was also increased threefold and yet other H-1B visas have been set aside just for foreign graduates of U.S. colleges; and currently for those who work in non-profit sector. See Lowell, B. Lindsay, 2001. "The Foreign Temporary (H-1b) Workforce and Shortages in Information Technology" Pages 131-162 in Wayne Cornelius (ed.), *The International Migration of the Highly Skilled: Demand, Supply, and Development Consequences in Sending and Receiving Countries*, San Diego: University of California.
62. At the outset of the 1990s an estimated 17 percent of all foreign students adjusted directly to permanent status. Less than half of these adjusted to employment visas and half married a U.S. citizen in 1992. See North, David S., 2001. "Some Thoughts on Nonimmigrant Student and Worker Programs," Pages 57-94 in B.L. Lowell (ed.) *Foreign Temporary Workers in America: Policies that Benefit the U.S. Economy*, Westport: Quorum Books.
63. GAO (U.S. General Accounting Office) 1992. *Immigration and the Labor Market: Nonimmigrant Alien Workers in the United States*. GAO/PEMD-92-17. Washington, D.C. It is unfortunate that we do not know the proportion of students (F visa) who become H-1Bs. North (op cit.) estimates that the small number of H-adjusters represents a 38 percent rate of H-1B adjustment in the early 1990s.
64. These estimates are made by the authors and are derived by combining several sources, e.g., DHS admissions yearbook data on adjustments, DHS data on H-1B petitions, and the New Immigrant Survey microdata. The estimates are comparable to estimates for doctorates made by Michael Finn, Oak Ridge Institute for Science and Engineering. See a forthcoming report by B. Lindsay Lowell



(<http://www12.georgetown.edu/sfs/isim/>).

65. Freeman, Richard B., 1976. "A Cobweb Model of the Supply and Starting Salary of New Engineers," *Industrial and Labor Relations Review*, 29(2): 236-48.
66. Observers close to students are aware of the connection; see Beyer, Gene, John J. Myers, Jeanie Hofer Smallwood, and Paul Worsey, 2003. "Post 9-11 Effect on Engineering Education at UMR," Proceedings of the 2003 ASEE Midwest Section Meeting University of Missouri-Rolla (<http://web.UMR.edu/~asee/Papers/14%20Worsey%20post%209-11%20effect.pdf>).
67. In fact, enrollments in physics are up over all (see High School Physics Enrollment Hits Record High, 2007, CCNews, <http://www.ccnmag.com/news.php?id=4723>).
68. Brown, Heath A. and Peter D. Syverson, 2004. "Findings from U.S. Graduate Schools on International Graduate Student Admissions Trends (Summer)," International Graduate Student Admissions Survey Program, Council of Graduate Schools.
69. Yale-Loehr, Papdemetriou and Cooper, op cit.
70. We would like to acknowledge this formulation that emerged from our discussions with Mark Regets of the National Science Foundation.

